

2

Final Environmental Impact Statement

AD-A207 706

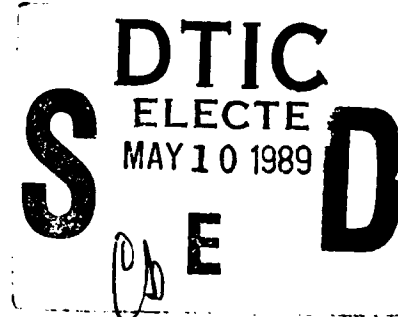
**Ox Mountain Sanitary Landfill
Apanolio Canyon Expansion Site
San Mateo County, California**

Volume I - Final EIS and Response to Comments



**US Army Corps
of Engineers**
San Francisco District

April 1989



Harding Lawson Associates
Engineers and Geoscientists

This document has been approved
for public release and sale; its
distribution is unlimited.

89 5 10 005

ADA207706

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) FINAL ENVIRONMENTAL IMPACT STATEMENT OX MOUNTAIN SANITARY LANDFILL APANOLIO CANYON EXPANSION SITE		5. TYPE OF REPORT & PERIOD COVERED Final EIS
7. AUTHOR(s) Harding Lawson Associates Novato, California		6. PERFORMING ORG. REPORT NUMBER
9. PERFORMING ORGANIZATION NAME AND ADDRESS U.S. Army Corps of Engineers, SF Dist. 211 Main Street San Francisco, CA 94105		8. CONTRACT OR GRANT NUMBER(s)
11. CONTROLLING OFFICE NAME AND ADDRESS Office of the Chief of Engineers U.S. Department of the Army Washington, D.C. 20314		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		12. REPORT DATE April 1989
		13. NUMBER OF PAGES 480 + Appendices
		15. SECURITY CLASS. (of this report) Unclassified
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES Appendices bound in separate volume		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Environmental Impact Landfill Wetlands Water Quality		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) Federal environmental impact document concerning a regulatory permit application by Browning-Ferris Industries of California under Section 404 of the Clean Water Act. The proposed project consists of the development of a Sanitary landfill in Apanolio Creek, San Mateo County, California		



DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, CORPS OF ENGINEERS
211 MAIN STREET
SAN FRANCISCO, CALIFORNIA 94105 - 1905

SUBJECT: Public Comment Period on the Final Environmental Impact Statement for the Ox Mountain Sanitary Landfill Apanolio Canyon Expansion Site, San Mateo County, California, Regulatory Permit Application No. 16611S91

TO WHOM IT MAY CONCERN:

1. Browning-Ferris Industries of California, Inc. (BFI), San Mateo County District, P.O. Box 1068, San Carlos, California 94070, has applied to the Department of the Army for authorization to place fill in association with various structures, e.g., roadways, sedimentation basins, dams, for the development of a sanitary landfill in Apanolio Creek, located approximately three miles northeast of Half Moon Bay, San Mateo County, California. This application is being processed pursuant to the provisions of Section 404 of the Clean Water Act (Public Notice No. 16611S91, June 8, 1987).
2. A Final Environmental Impact Statement (FEIS) has been prepared by the U.S. Army Corps of Engineers, San Francisco District, to comply with the environmental impact document requirements of the National Environmental Policy Act and is being circulated to appropriate governmental agencies, interested organizations, and the public for review and comment. The complete Final EIS consists of two volumes: (1) main text, and 2) appendices.
3. Please submit your comments to the District Engineer, San Francisco District by MAY 30, 1989 (or by the end of the 30-day comment period specified by the Notice of Availability published in the Federal Register, whichever is later) in order that they may be considered along with other relevant information in the permit decision.

Accession For	
NTIS GRA&I	<input checked="" type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By	
Distribution/	
Availability Codes	
Dist	Avail and/or Special
A-1	

Galen H. Yanagihara
Galen H. Yanagihara
Colonel, Corps of Engineers
District Engineer



Cover Sheet

Final Environmental Impact Statement

Ox Mountain Sanitary Landfill
Apanolio Canyon Expansion Site

San Mateo County, California

April 1989

Lead Agency: U.S. Army Corps of Engineers
San Francisco District

Lead Agency Contacts:

Mr. Barney Opton
Mr. David Hodges
Environmental Branch
San Francisco District
Corps of Engineers
211 Main Street
San Francisco, CA
415/974-0441

Mr. Skid Hall
Regulatory Branch
San Francisco District
Corps of Engineers
211 Main Street
San Francisco, CA
415/974-0426

Abstract

Browning-Ferris Industries of California, Inc. (BFI), San Mateo County District, P.O. Box 1068, San Carlos, California 94070, has applied to the Department of the Army for authorization to place fill in association with various structures, e.g., roadways, sedimentation basins, dams, for the development of a sanitary landfill in Apanolio Creek, located approximately three miles northeast of Half Moon Bay, San Mateo County, California. This application is being processed pursuant to the provisions of Section 404 of the Clean Water Act (33 U.S.C. 1344).

BFI currently operates a landfill at Ox Mountain Ranch, which consists of two principal canyons, the Corinda Los Trancos Canyon and Apanolio Canyon. The Corinda Los Trancos Canyon landfill has been used as a solid waste disposal site for San Mateo County since 1976, and will reach design capacity in October 1990. BFI proposes to expand the existing operation westward into the neighboring Apanolio Canyon. This report addresses the potential effects of the proposed sanitary landfill expansion. In addition to the proposed action, four landfill alternatives are evaluated. Alternatives to the proposed action include a reduced fill landfill in Apanolio Canyon, and expansion of the currently operating landfill in Corinda Los Trancos Canyon, a landfill in Nuff Canyon, and a No Action alternative.

PREFACE

This Final Environmental Impact Statement (EIS) assess the environmental impacts of five alternatives for expansion of the Ox Mountain Sanitary Landfill in San Mateo County, California. The Draft EIS was prepared and circulated for a 45-day public comment period that ended on July 18, 1988. The comments received on the draft document are presented in Chapter 9.0, Draft EIS Review. This Final EIS consists of a modification of the draft document. These modifications reflect new information not available at the time of publication of the Draft EIS and information developed in response to comments received during the public comment period. Changes to the Draft EIS within Chapters 1.0 through 8.0 are indicated by italic type. In addition, new appendixes (Volume II) have been added.

Final
Environmental Impact Statement
Ox Mountain Sanitary Landfill
Apanolio Canyon Expansion Site

TABLE OF CONTENTS

1.0	SUMMARY	1-1
1.1	Proposed Action and Alternatives	1-1
1.2	Summary of Impacts from Proposed Action	1-7
1.3	Comparison of Alternatives	1-13
2.0	INTRODUCTION	2-1
2.1	County Landfill History	2-2
2.2	History of Proposed Action	2-7
2.3	Purpose and Need	2-9
2.4	Regulatory Framework	2-11
3.0	PROPOSED ACTION AND ALTERNATIVES	3-1
3.1	Introduction	3-1
3.2	Landfill Site Selection Criteria.	3-2
3.3	Potential Landfill Sites	3-3
	Site Identification Studies	3-3
3.4	Site Evaluation (Screening)	3-12
3.5	Proposed Action and Alternatives	3-26
	a. Apanolio Canyon - 1,200-foot (Preferred Alternative)	3-35
	b. Apanolio Canyon 850-foot (Reduced Fill Alternative)	3-59
	c. Corinda Los Trancos Canyon - (Forefill Alternative)	3-62
	d. Nuff Canyon	3-65
	e. No Action	3-69
	Off-site Alternative	3-70
	Alternative Technology	3-70
4.0	AFFECTED ENVIRONMENT :	4-1
4.1	Geology, Soils and Seismicity	4-1
	a. Regional	4-1
	b. Apanolio Canyon	4-3
	c. Corinda Los Trancos Canyon	4-12
	d. Nuff Canyon	4-16
4.2	Hydrology and Water Quality	4-20
	a. Regional	4-20
	b. Apanolio Canyon	4-23
	c. Corinda Los Trancos Canyon	4-35
	d. Nuff Canyon	4-41

4.3	Biology	4-44
4.3.1	Vegetation	4-44
	a. Regional	4-44
	b. Apanolio Canyon	4-45
	c. Corinda Los Trancos Canyon	4-47
	d. Nuff Canyon	4-49
4.3.2	Wildlife	4-51
	a. Regional	4-51
	b. Apanolio Canyon	4-52
	c. Corinda Los Trancos Canyon	4-52
	d. Nuff Canyon	4-53
4.3.3	Aquatic	4-53
	a. Regional	4-53
	b. Apanolio Canyon	4-54
	c. Corinda Los Trancos Canyon	4-55
	d. Nuff Canyon	4-56
4.3.4	Sensitive Species	4-58
	a. General	4-58
	b. Marbled Murrelet	4-58
	c. San Francisco Garter Snake	4-60
	d. Invertebrates	4-61
	e. Plants	4-62
4.4	Transportation and Circulation	4-64
	a. Regional Highway Network	4-64
	b. Ox Mountain Sanitary Landfill	4-70
	c. Nuff Canyon	4-74
4.5	Air Quality	4-75
4.6	Noise	4-78
	a. Existing Noise Levels	4-79
	b. Existing Landfill Operations - Corinda Los Trancos Canyon	4-81
	c. Nuff Canyon Quarry Operation	4-82
4.7	Public Health and Safety	4-84
4.8	Public Facilities and Services	4-88
4.9	Cultural Resources	4-89
	a. Regional	4-90
	b. Apanolio Canyon	4-91
	c. Corinda Los Trancos Canyon	4-93
	d. Nuff Canyon	4-94
4.10	Aesthetics	4-95
	a. Regional	4-95
	b. Apanolio Canyon	4-96
	c. Corinda Los Trancos Canyon	4-97
	d. Nuff Canyon	4-97
4.11	Land Use Plans and Policies	4-99
	a. Regional	4-99
	b. Apanolio Canyon	4-103
	c. Corinda Los Trancos Canyon	4-105
	d. Nuff Canyon	4-106
4.12	Economics	4-108

5.0	ENVIRONMENTAL CONSEQUENCES	5-1
5.1	Geology, Soils and Seismicity	5-1
	a. Apanolio Canyon - 1,200-foot	5-1
	b. Apanolio Canyon - 850-foot	5-4
	c. Corinda Los Trancos Canyon - Forefill	5-5
	d. Nuff Canyon	5-8
	e. No Action	5-10
	f. Mitigation Measures	5-10
5.2	Hydrology and Water Quality	5-11
	a. Apanolio Canyon - 1,200-foot	5-11
	b. Apanolio Canyon - 850-foot	5-15
	c. Corinda Los Trancos Canyon - Forefill	5-16
	d. Nuff Canyon	5-18
	e. No Action	5-20
	f. Mitigation Measures	5-20
5.3	Biology	5-22
	a. Apanolio Canyon - 1,200-foot	5-22
	Vegetation	5-22
	Wildlife	5-26
	Aquatic	5-27
	Endangered Species	5-29
	b. Apanolio Canyon - 850-foot	5-30
	Vegetation	5-30
	Wildlife	5-30
	Aquatic	5-30
	Endangered Species	5-30
	c. Corinda Los Trancos Canyon - Forefill	5-30
	Vegetation	5-30
	Wildlife	5-32
	Aquatic	5-32
	Endangered Species	5-33
	d. Nuff Canyon	5-33
	Vegetation	5-33
	Wildlife	5-34
	Aquatic	5-34
	Endangered Species	5-35
	e. No Action	5-35
	f. Mitigation Measures	5-35
5.4	Transportation	5-40
	a. Apanolio Canyon - 1,200-foot	5-40
	b. Apanolio Canyon - 850-foot	5-47
	c. Corinda Los Trancos Canyon - Forefill	5-48
	d. Nuff Canyon	5-48
	e. No Action	5-49
	f. Mitigation Measures	5-50

5.5	Air Quality	5-51
	a. Apanolio Canyon - 1,200-foot	5-51
	b. Apanolio Canyon - 850-foot	5-55
	c. Corinda Los Trancos Canyon - Forefill	5-55
	d. Nuff Canyon	5-55
	e. No Action	5-55
	f. Mitigation Measures	5-56
5.6	Noise	5-56
	a. Apanolio Canyon - 1,200-foot	5-56
	b. Apanolio Canyon - 850-foot	5-58
	c. Corinda Los Trancos Canyon - Forefill	5-58
	d. Nuff Canyon	5-59
	e. No Action	5-59
	f. Mitigation Measures	5-59
5.7	Public Health and Safety	5-60
	a. Apanolio Canyon - 1,200-foot	5-60
	b. Apanolio Canyon - 850-foot	5-63
	c. Corinda Los Trancos Canyon - Forefill	5-65
	d. Nuff Canyon	5-67
	e. No Action	5-69
	f. Mitigation Measures	5-70
5.8	Public Facilities and Services	5-71
	a. Apanolio Canyon - 1,200-foot	5-71
	b. Apanolio Canyon - 850-foot	5-71
	c. Corinda Los Trancos Canyon - Forefill	5-72
	d. Nuff Canyon	5-72
	e. No Action	5-72
	f. Mitigation Measures	5-73
5.9	Cultural Resources	5-73
	a. Apanolio Canyon - 1,200-foot	5-73
	b. Apanolio Canyon - 850-foot	5-73
	c. Corinda Los Trancos Canyon - Forefill	5-73
	d. Nuff Canyon	5-73
	e. No Action	5-74
	f. Mitigation Measures	5-74
5.10	Aesthetics	5-75
	a. Apanolio Canyon - 1,200-foot	5-75
	b. Apanolio Canyon - 850-foot	5-76
	c. Corinda Los Trancos Canyon - Forefill	5-76
	d. Nuff Canyon	5-77
	e. No Action	5-77
	f. Mitigation Measures	5-78
5.11	Land Use Plans and Policies	5-78
	a. Apanolio Canyon - 1,200-foot	5-78
	b. Apanolio Canyon - 850-foot	5-79
	c. Corinda Los Trancos Canyon - Forefill	5-79
	d. Nuff Canyon	5-80
	e. No Action	5-82
	f. Mitigation Measures	5-82

5.12	Economics	5-83
a.	Apanolio Canyon - 1,200-foot	5-83
b.	Apanolio Canyon - 850-foot	5-85
c.	Corinda Los Trancos Canyon - Forefill	5-86
d.	Nuff Canyon	5-88
e.	No Action	5-92
f.	Mitigation Measures	5-93
5.13	Cumulative Impacts	5-93
5.14	Unavoidable Adverse Impacts	5-94
5.15	Short-term Uses vs. Long-term Productivity	5-96
5.16	Irreversible/Irretrievable Commitments of Resources	5-97
6.0	CONSULTATION AND COORDINATION	6-1
6.1	Public Involvement	6-1
6.2	Agency Contact and Coordination	6-3
7.0	REFERENCES	7-1
7.1	References	7-1
7.2	Personal Communications	7-3
8.0	LIST OF PREPARERS	8-1
9.0	<i>DRAFT EIS REVIEW</i>	
9.1	<i>Introduction</i>	
9.2	<i>Comment Letter Overview</i>	
9.3	<i>Public Hearing Overview</i>	
9.4	<i>Comment Letters and Responses</i>	
9.5	<i>Public Hearing Comments and Responses</i>	

INDEX

LIST OF FIGURES

3.3-1	Potential Landfill Locations, 1963 and 1987 Studies	3-5
3.5-1	Regional Location Map	3-28
3.5-2	Ox Mountain Ranch Property Boundary	3-29
3.5-3	Plan of Existing Corinda Los Trancos Landfill	3-30
3.5-4	Apanolio Canyon - 1,200-foot Alternative	3-36
3.5-5	Typical Landfill Cross Section - Final Slope/Bench Construction	3-37
3.5-6	Storm Drainage System Components	3-40
3.5-7	Underdrain System Cross Section	3-42
3.5-8	Peak Flow Reduction Pond Cross Section	3-43
3.5-9	Energy Dissipator Design	3-46
3.5-10	Typical Hydrauger Design	3-48
3.5-11	Sediment Basin Design	3-50
3.5-12	Roller Compacted Concrete Dam Cross Section	3-51
3.5-13	Apanolio Canyon Access	3-53
3.5-14	Alternative Landfill Locations	3-60
3.5-15	Apanolio Canyon - 850-foot Alternative	3-61
3.5-16	Corinda Los Trancos Canyon - Forefill Alternative	3-63
3.5-17	Nuff Canyon Alternative	3-67
4.1-1	Regional Geology and Major Faults	4-2
4.1-2	Site Geology - Apanolio Canyon	4-5
4.1-3	Apanolio Canyon Geologic Cross Section Locations	4-8
4.1-4	Apanolio Canyon Geologic Cross Sections	4-9
4.1-5	Corinda Los Trancos Canyon Geologic Cross Section Locations . .	4-14
4.1-6	Corinda Los Trancos Canyon Geologic Cross Sections	4-15
4.1-7	Nuff Canyon Geologic Cross Section Locations	4-18
4.1-8	Nuff Canyon Geologic Cross Sections	4-19
4.2-1	Pilarcitos Creek Watershed (Northern Portion)	4-21
4.2-2	Apanolio Canyon Surface- and Ground-Water Sampling Locations .	4-29

4.2-3	Surface- and Ground-Water Sampling Locations	4-34
4.2-4	Corinda Los Trancos Canyon Ground-Water Sampling Stations . . .	4-38
4.4-1	Major Highways, Project Area	4-71
5.1-1	Apanolio Canyon Longitudinal Geologic Section	5-3
5.1-2	Corinda Los Trancos Canyon Longitudinal Geologic Section . . .	5-7
5.1-3	Nuff Canyon Longitudinal Geologic Section	5-9
5.2-1	Recommended Maximum Acreages of Cleared Hills and Unvegetated Landfill Crown	5-23

LIST OF TABLES

1.3-1	Comparison of Alternatives	1-28
2.1-1	San Mateo County Landfill History	2-3
2.3-1	Landfills in San Mateo County (1987)	2-10
2.4-1	Summary of Regulatory Framework for Apanolio Canyon Expansion .	2-17
3.2-1	Landfill Site Selection Criteria	3-2
3.3-1	Potential Landfill Locations (1963)	3-4
3.3-2	Potential Landfill Sites - San Mateo County	3-6
3.3-3	Potential Out-of-County Landfill Sites	3-11
3.4-1	Evaluation of Sites Identified in the San Mateo County Waste Disposal Site Survey, 1963	3-15
3.4-2	Evaluation of Sites Identified by San Mateo County, Department of Public Works Study, 1987	3-17
3.4-3	Cost Comparison of Existing Landfill Sites Outside of San Mateo County	3-19
3.4-4	Summary of Costs	3-16
3.5-1	Resource Recycling/Recovery Activities - San Mateo County . . .	3-71
4.2-1	Contaminant Levels and Standards for Municipal and Agricultural Water Supplies	4-24
4.2-2	Mean Monthly Streamflows in Apanolio Creek	4-26
4.2-3	Flood Frequency Analysis for Apanolio Creek Basin (Natural Conditions)	4-27
4.2-4	Ground-water Elevation Data for Apanolio Canyon	4-30
4.2-5	Surface-water Quality Data for Apanolio Basin	4-32
4.2-6	Ground-water Quality Data for Apanolio Basin	4-33
4.2-7	Ground-water Constituent Analysis, Corinda Los Trancos Canyon (Prior to Landfill Construction)	4-39

4.2-8	Surface and Ground-water Quality Data for Corinda Los Trancos Basin	4-40
4.2-9	Leachate Analysis Results. Upper and Lower Leachate Collection Tanks, Corinda Los Trancos Canyon Landfill	4-42
4.3-1	Sensitive Species Potentially Occurring Within Project Vicinity	4-59
4.4-1	Level of Service Concept, Two-Lane, Two-Way Rural Highways . .	4-67
4.4-2	Traffic Counts, Volume/Capacity Ratios, and Levels of Service on Highway 92/Route 35 Intersection (Weekday)	4-68
4.4-3	Highway 92 Traffic Volumes for 1986	4-69
4.6-1	Early Morning Traffic Noise Measurements at Highway 92 and Pilarcitos Quarry Road Intersection	4-81
4.6-2	Noise Levels Generated During Quarry Operation	4-83
4.12-1	Historic Population, San Mateo County and Regional, 1970-1985	4-108
4.12-2	Projected Population, San Mateo County Region, 1985-2005 . . .	4-109
4.12-3	Projected Households	4-110
4.12-4	Comparison of Household Growth with Potential Housing Units, San Mateo County, 1980-2005	4-111
4.12-5	Historic and Projected Employment, San Mateo County, 1980-2005	4-113
5.3-1	Comparison of Vegetation Types Removed	5-25
5.4-1	Estimated Weekday Traffic to Ox Mountain Sanitary Landfill . .	5-40
5.4-2	Traffic Impacts to Westbound Highway 92	5-42
5.4-3	Traffic Impacts to Eastbound Highway 92	5-44
5.5-1	Weekly Pollutant Emission Levels for Refuse Transportation (pounds per day)	5-54
5.5-2	Bay Area Total Emissions Levels and Project Contributions (1990)	5-54
5.6-1	Estimated CNEls for Highway 92 Corridor in the Project Vicinity	5-57

5.12-1	Construction Costs for Proposed Apanolio Canyon Project and Alternatives	5-84
5.12-2	<i>Initial Construction Costs for Proposed Apanolio Canyon Project and Alternatives</i>	<i>5-84</i>
5.12-3	Estimate of Nuff Canyon Mineral Resource (Pilarcitos Quarry)	5-90
6.1-1	Agencies and Citizens Commenting on Public Notice	6-2
6.1-2	Representation at September 3, 1987 Scoping Session	6-3
6.2-1	Agency Interaction and Coordination	6-4
6.2-2	Agency Representation Attending August 26, 1987 Meeting	6-7
9.2-1	<i>Comment Letters Received on DEIS</i>	
9.3-1	<i>Persons Presenting Oral Comments at July 7, 1988 Public Hearing</i>	

1.0 SUMMARY

The Apanolio Canyon Expansion Site *Final* Environmental Impact Statement (*FEIS*) assesses the environmental consequences of five alternatives for expansion of the existing Ox Mountain Sanitary Landfill in San Mateo County, California. This chapter of the *FEIS* provides an overview of the proposed project (action) and alternatives (Section 1.1), the environmental impacts associated with the proposed action (Section 1.2), and a comparison of the impacts resulting from each of the proposed alternatives (Section 1.3).

1.1 Proposed Action and Alternatives

Project History

The handling and disposal of solid waste generated in San Mateo County has been the subject of detailed study and planning by the County for many years. In 1963, the first solid waste disposal site identification study was conducted to determine potential locations for landfill development within the County. Through systematic, county-wide screening, this study and subsequent County planning studies and documents identified the Ox Mountain Ranch as the County's primary long-range landfill location (letter from Tom Nolan, San Mateo County, to Col. Yanagihara, U.S. Army Corps, dated October 16, 1987--see Appendix C). In 1965, San Mateo County Scavenger Company (later *Browning-Ferris Industries of California, Inc.* [*BFI*] - *San Mateo County District*) began plans for development of the Corinda Los Trancos Canyon phase of the Ox Mountain Sanitary Landfill. The Corinda Los Trancos Canyon phase became operational in 1976. At that

time, expansion into the adjacent Apanolio Canyon upon completion of fill in Corinda Los Trancos Canyon was anticipated and BFI began planning for that expansion. An application for a use permit was submitted by BFI in 1982 and in 1984, a *Final Environmental Impact Report (FEIR)* was completed and certified by the San Mateo County Planning Commission for development of the Apanolio Canyon portion of the Ox Mountain Sanitary Landfill. In 1986, the U.S. Army Corps of Engineers (Corps) determined that it had jurisdiction under Section 404 of the Clean Water Act over activities affecting portions of Apanolio Canyon and that Corps authorization would be required prior to such activities. BFI submitted an application for a Section 404 permit in 1987. This EIS is being prepared as part of the Corps permit review process and as a requirement of the National Environmental Policy Act (NEPA).

Purpose and Need

The number of disposal sites in San Mateo County has steadily decreased in the past 25 years as the old, smaller facilities have reached their design capacities. Since the opening of the Ox Mountain Sanitary Landfill in 1976, the Corinda Los Trancos Canyon facility has become the major recipient of County generated solid waste. The Ox Mountain Sanitary Landfill is the only facility that receives waste materials collected by scavenger companies, and currently handles the disposal of 91 percent of the solid waste generated in San Mateo County. The Corinda Los Trancos Canyon facility is anticipated to reach design capacity in *October 1990*, requiring establishment of an alternative major landfill disposal site for

San Mateo County solid waste. Anticipating this closure, San Mateo County planning documents including the County's Solid Waste Management Plan, have identified the Apanolio Canyon portion of the Ox Mountain Ranch as the County's primary future landfill.

Proposed Action

Browning-Ferris Industries of California, Inc., proposes expansion of the Ox Mountain Sanitary Landfill, a Class III (non-hazardous waste) facility, by constructing a large capacity landfill in Apanolio Canyon. Apanolio Canyon is located approximately 3 miles northeast of the City of Half Moon Bay, and is the adjacent canyon to the west of the existing Corinda Los Trancos Canyon landfill.

Site access would be via Highway 92 and an existing two-lane paved access road through the existing Corinda Los Trancos Canyon landfill. The access road would be extended on site from the existing landfill into Apanolio Canyon.

The canyon is steep walled with side slopes ranging from 20 to 100 percent and elevations from 500 to 1,500 feet in the proposed project area. The landfill would fill the northern portion of the canyon from an elevation of approximately 500 feet to an ultimate perimeter elevation of 1,200 feet. The 285-acre site would have a refuse capacity of 123.7 million cubic yards and would have an estimated life-span of approximately 93 years.

Landfill construction would be a canyon cut/fill type of operation similar to that used at the Corinda Los Trancos Canyon site. Fill would

begin at the lowest portion of the landfill and would progress from the back of the Canyon forward, and then upward. The working face of the landfill would be limited to a small area and would have a 3:1 (horizontal to vertical) final slope. Daily and interim cover would require an estimated 200,000 cubic yards of material per year which is available from on-site sources.

Site drainage would be controlled by installation of separate surface-water, ground-water, and leachate collection and removal systems. A compacted fill liner (subgrade barrier/clay liner) would be constructed beneath the landfill to prevent leachate from escaping the landfill and to prevent ground water from entering the landfill. A cast-in-place reinforced concrete underdrain would be installed within a bedrock trench foundation beneath the landfill to convey surface water intercepted from areas upslope of the fill and to collect ground water from beneath the landfill liner. Surface drainage ditches would convey surface runoff from the fill surface and adjacent natural slopes to a sedimentation basin below the landfill. The leachate collection system would allow controlled removal of leachate from the landfill and prevent leachate buildup within the landfill.

Proposed Action Alternatives

Since the early 1960s, San Mateo County has investigated over 20 locations for potential landfill development. Many of these sites have been eliminated from consideration due to their proximity to bayshore or coastal wetlands, Holocene faults, and their physical characteristics

(e.g., site capacity). While both the County's site selection process and its Solid Waste Management Plan have identified Apanolio Canyon as the site for future landfill expansion, this EIS further evaluates alternatives to such expansion in Apanolio Canyon as now proposed by BFI. These alternatives include: 1) a reduced project in Apanolio Canyon in which the northern portion of the canyon would be filled to an elevation of 850 feet instead of the proposed 1,200 feet, 2) a Corinda Los Trancos Canyon forefill project, 3) development of a landfill in Nuff Canyon, and 4) No Action. These alternatives are summarized below.

Apanolio Canyon 850-foot - Reduced Project

This alternative would fill northern Apanolio Canyon to a perimeter elevation of 850 feet rather than 1,200 feet (Proposed Action). Site access, design, and construction would be similar to the 1,200-foot alternative. This alternative would occupy approximately 128 acres, would have an estimated refuse capacity of 27.6 million cubic yards and a life-span of approximately 25 years.

Corinda Los Trancos Canyon - Forefill

This alternative would be an extension of the existing Corinda Los Trancos Canyon facility. The toe of the landfill would be approximately 2,400 feet down canyon from the existing facility. Site access would be via the existing landfill access road extending from Highway 92. An area of approximately 78 acres would be filled to a maximum elevation of 800 feet at the eastern boundary. The landfill would have a refuse capacity of approximately 17.3 million cubic yards and an estimated life-span of 16 years.

Nuff Canyon

This alternative would fill the northern portion of Nuff Canyon, the adjacent canyon to the east of the existing Corinda Los Trancos Canyon facility. Design and construction of this alternative would be similar to the 1,200-foot Apanolio Canyon alternative. Nuff Canyon would be filled from an elevation of approximately 480 feet to a final elevation of 1,100 feet. Fill would begin 1,000 feet north of the northerly limit of the existing quarry operation in the Canyon. Site access would be via Highway 92 and the existing access road to the quarry site. The landfill would occupy approximately 117 acres, would have a refuse capacity of 30.2 million cubic yards, and a life-span of 27 years.

No Action

The No Action alternative would be the result of denial of the Corps permit application for fill placement in Apanolio Canyon, inability of the proponent to obtain waste discharge requirements from the State Water Resources Control Board, or denial of any permits or consistency determinations related to the proposed action. This action would leave San Mateo County without an identified solution to its long-term solid waste disposal needs. Identification and permitting of a new landfill site in San Mateo County, or transport of solid waste generated within the County to an out-of-county site would be imperative in order for San Mateo County to continue to provide waste disposal for County residents.

1.2 Summary of Impacts from Proposed Action

The following is a summary of project impacts identified by the environmental analysis presented in Chapter 5.0 of this *FEIS*. The summary is organized by topical area (e.g., Geology, Hydrology, etc.) and identifies the potential impacts resulting from the project.

Geology, Soils, and Seismicity

The project would fill the northern portion of Apanolio Canyon, modifying the topography of the site. Site preparation and landfill operation would increase the potential for erosion and sedimentation in Apanolio Creek downstream of the project area. Erosion and sediment control measures proposed as part of the project (e.g., sedimentation basin, mulching and seeding of all cut slopes) are intended to remove sediments from runoff flows prior to entering Apanolio Creek.

Clearing and excavation operations along the canyon walls during construction would increase the potential for landsliding. This potential increase is expected to be very minor and would be more of a maintenance impact than a threat to safety or the environment. Slopes would be stabilized as required to prevent failures that could affect water quality or impair landfill operations.

The site is within an area with historic seismic activity and is located approximately 3 miles to the west of the San Andreas fault zone. Severe ground shaking caused by an earthquake on one of the active Bay Area faults could cause landsliding along the canyon walls, and could cause structural damage to the landfill underdrain, liner, or leachate collection

systems. Such failure could result in movement of leachate into local ground- and/or surface-water systems, or could allow infiltration of water into the landfill. The landfill liner, leachate, and water management systems have been designed to withstand the maximum probable earthquake (mpe) on the nearby San Andreas Fault (M8.3 on Richter Scale). Back-up systems (contingency plan) are incorporated into project design as required by Title 23 Subchapter 15 of the California Administrative Code (CAC). Placing the stormwater underdrain and subgrade barrier/clay liner on fresh bedrock would also eliminate the risk of many common seismic hazards (e.g., settlement/liquefaction).

Hydrology and Water Quality

Landfill construction would ultimately fill approximately 20 percent of the Apanolio Canyon watershed. The landfill would require drainage control of approximately 5,600 feet of Apanolio Creek and would increase mean annual streamflows by an estimated 19 percent (from 0.96 cfs to 1.2 cfs) at the Ox Mountain Ranch property line. However, over the life of the project, peak flows would not increase because flow reduction ponds would retain storm flows above the landfill crown and in the sedimentation basin. Summer flows (July through September) would decrease 40 percent (from 0.05 cfs to 0.03 cfs) over the life of the landfill. *To mitigate this decrease in summer flows, BFI has developed a streamflow augmentation plan which will ensure no change in summer low flows caused by landfill development. Potential loss of lower Apanolio Canyon ground-water recharge would be mitigated by installation of a series of ground-water recharge wells.*

Earthmoving and clearing activities in Apanolio Creek could increase the sediment loads. The proposed sedimentation basin, if properly maintained, would effectively remove sand and silt particles from runoff. The most likely impact on the water quality of Apanolio Creek would be a potential increase in turbidity caused by greater suspended sediment loads in the clay size range.

The landfill liner, leachate collection and removal system, peak flow reduction ponds, sedimentation basin, and storm flow control structures are designed to protect surface and ground water quality in the project area. Proper maintenance of these water management systems and appropriate erosion control measures would reduce the potential for degradation of the quality of downstream uses of surface- and/or ground-water supplies. *In addition, a remedial action plan has been developed which defines corrective actions in the unlikely event that the landfills water resource protection components fail.*

Biology

The proposed action would eliminate approximately 285 acres of vegetation and wildlife habitat currently occupying the project area. Approximately 3.4 acres of lands designated as wetlands by the Corps that occur along the stream channel of Apanolio Creek would be filled or disturbed. Upon completion of the proposed landfill, approximately half of the scrub and one fifth of the woodland vegetation in Apanolio Canyon would be eliminated. A mitigation plan incorporated into the project is intended

to compensate for this loss through both on- and off-site habitat creation and enhancement. This mitigation plan is summarized in 5.3f, and is contained in Appendix B.

Drainage control of approximately 5,600 feet of Apanolio Creek would eliminate an estimated 4,649 feet of resident rainbow trout habitat (including 595 feet of potential rainbow trout habitat). Fisheries habitat loss is proposed to be offset through the mitigation plan mentioned above. Included in this plan is the enhancement of stream habitat and removal of fish migration barriers in the Pilarcitos and surrounding watersheds as well as development of a steelhead fishery in Corinda Los Trancos Creek.

Field surveys and literature review indicate that no threatened or endangered species would be affected by the proposed action.

Transportation and Circulation

Traffic volumes generated from the expansion project would be similar to the current daily traffic flow to the existing landfill site.

Approximately 90 26-ton transfer truck trips currently use Highway 92 from I-280 to the existing Ox Mountain facility on a daily basis. An additional 10 26-ton transfer truck trips along with 11 collection trucks and 50 private vehicles deliver refuse to the landfill from west of the facility daily. This truck traffic contributes to the existing traffic congestion on Highway 92. An estimated 30 percent of the westbound midday capacity of the Highway is used by landfill traffic. Traffic restrictions defined in the facilities use permit prevent truck traffic from causing delays during morning and evening commute hours.

As the quantity of waste requiring landfill disposal in San Mateo County increases in future years, truck and automobile traffic volumes to the site would increase. This increase, along with the expected increase in automobile traffic on Highway 92, would maintain and possibly increase traffic congestion along this route in future years.

Air Quality

Air quality impacts resulting from the proposed project would be largely offset by closure of the existing Corinda Los Trancos Canyon facility. Fugitive dust and exhaust emissions associated with construction and operation of the Apanolio Canyon facility would be similar to those generated at Corinda Los Trancos.

The proposed action would generate dust at the site by earthmoving operations during landfill construction and operation, but fugitive dust would likely settle on site. Construction equipment (e.g., track-laying tractors) and vehicle traffic (primarily transfer trucks) to the site would generate exhaust emissions at the landfill site, and along the truck haul routes to the facility. As the volume of solid waste being delivered to the Apanolio Canyon site increases in future years, an increase in project-related emissions would also occur.

Noise

Ox Mountain truck traffic currently contributes to existing noise levels along Highway 92, although noise generation along this route is dominated by automobile traffic. Truck traffic from the proposed expansion project would continue to contribute to noise impacts along this route.

Landfill-related traffic noise would increase in future years as the quantity of solid waste being delivered to the facility increased.

Noise impacts to residents in the vicinity of the landfill would be minor, and would be within applicable County noise ordinance standards.

Public Health and Safety

Construction and operation of a landfill in Apanolio Canyon could create a public health nuisance by potentially attracting rodents, insects, and other vectors capable of transporting diseases. Other potential public health and safety concerns include fire hazard, landfill gas migration, and surface- and ground-water quality degradation. Because BFI would employ standard operating procedures such as crushing, compacting and daily covering of wastes, no impacts from disease carrying vectors would be expected. Controlled burns and employee fire safety training would reduce the risk of wildland fires. A methane collection and recovery system would be installed at the landfill. Although failure of the engineered surface- and ground-water protection systems is unlikely, the contingency plan developed for the site would provide remedial measures for protection of downstream water resources should a problem develop.

Public Facilities and Services

Operation of a landfill in Apanolio Canyon would not substantially burden typical community services and facilities such as police protection, sewage disposal, water supply or public utilities. Landfill or wildland fires would involve the California Department of Forestry equipment and personnel.

Cultural Resources

No cultural resources were identified through literature and field studies.

Aesthetics

The proposed project would permanently alter the visual quality of Apanolio Canyon from vantage points within the canyon or from surrounding ridges. The project would not be visible to residents or travelers along Highway 92, nor from vantage points in Half Moon Bay.

Plans and Policies

The project would be consistent with applicable planning documents, ordinances, and zoning regulations. The facility would be in conformance with the San Mateo County Solid Waste Management Plan (1984) and would be consistent with long-range county planning objectives. A use permit (UP-82-3), coastal development permit (CDP-82-4), and grading permit (GP-86-7) have been issued for the facility by San Mateo County.

Economics

Total cost for construction of the preferred alternative is \$129.4 million. This cost includes \$5 million for design and permitting and \$124.4 million for construction. Total cost per cubic yard of compacted refuse resulting from these costs is \$1.05.

1.3 Comparison of Alternatives

To briefly compare the potential impacts resulting from the project alternatives (i.e., Apanolio Canyon - 850-foot, Corinda Los Trancos Canyon - Forefill, Nuff Canyon, and No Action) the following is a summary of

impacts presented by topic area as in Section 1.2. For each of the topic areas, the impacts to this area are briefly presented by alternative. A summary of these impacts is presented in Table 1.3-1, along with impacts from the *applicant's* preferred alternative, at the end of the impact discussion.

Geology, Soils and Seismicity

Apanolio Canyon - 850-foot (Reduced Project)

Impact to topography under this alternative would be less than that of the *applicant's* preferred alternative in that the canyon would be filled to the 850-foot elevation rather than 1,200-foot perimeter elevation and less acreage of disturbance would be involved. The potential for erosion and landsliding would be similar to the 1,200-foot alternative; however, completion of the reduced project in an estimated 25 years would reduce the duration of these impacts compared to the *applicant's* preferred alternative. Seismic impacts would be similar to the 1,200-foot alternative.

Corinda Los Trancos Canyon - Forefill

This alternative would modify the topography in Corinda Los Trancos Canyon south of the existing facility. Erosion potential in the Canyon would increase; however, because of the more gradual slopes within this canyon, the potential for erosion and landsliding is less than in Apanolio Canyon. Seismic impacts may be slightly greater than the *applicant's* preferred alternative due to the closer proximity of this site to the San Andreas fault.

Nuff Canyon

Topographic impacts in Nuff Canyon would be similar to those in Apanolio Canyon under the *applicant's* preferred alternative. Potential for erosion and landsliding in Nuff Canyon would also be similar. Seismic impacts could be greater under this alternative due to the closer proximity of this canyon to the San Andreas fault.

No Action

Modification of the topography, potential project related increases in erosion and sediment loads in Apanolio Creek would not occur under this alternative. Any potential seismic risks to a landfill in Apanolio Canyon would not occur. However, similar geological impacts could be expected at an as yet unidentified landfill development site.

Hydrology and Water Quality

Apanolio Canyon - 850-foot (Reduced Project)

The reduced project would require diversion of stream and ground water flows in the upper reaches of Apanolio Canyon as with the *applicant's* preferred alternative. However, with the reduced project, approximately 150 acres of vegetation remain in the upper watershed to potentially absorb runoff and reduce the quantity of surface and ground water flows requiring diversion. Surface- and ground-water quality downstream of the project would be subject to the same potential impacts as those identified for the *applicant's* preferred alternative.

Corinda Los Trancos Canyon - Forefill

This alternative would require culverting of approximately 3,400 feet of Corinda Los Trancos Creek. The landfill extension would increase runoff from the site; however, sedimentation and storm water management structures would control peak flows. Downstream water quality would be subject to the same potential impacts as in the Apanolio Canyon alternatives.

Nuff Canyon

Approximately 4,200 feet of Nuff Creek would be culverted under this alternative. The landfill would fill approximately 20 percent of the Nuff Canyon watershed. The water quality of Nuff Creek and surrounding ground water resources is currently unknown. Impacts from operation of a landfill in Nuff Canyon would be similar to those in Apanolio Canyon; however, fewer downstream beneficial uses of water resources exist in Nuff Canyon.

No Action

No potential impact to Apanolio Creek flows, stream sediment loads, turbidity, or downstream beneficial uses would result under this alternative.

Biology

Apanolio Canyon - 850-foot (Reduced Project)

The 850-foot alternative in Apanolio Canyon would eliminate an estimated 7 to 10 acres of riparian woodland habitat and would fill an estimated 2.7 acres of lands that are designated wetlands under Corps jurisdiction, as compared to about 3.4 acres of such lands in the 1,200-foot project.

The impact to resident trout habitat would be similar to the *proposed* 1,200-foot alternative since fisheries resources are located in the downstream portions of the project site. Upland vegetation in the elevations between 850 and 1,200 feet would not be disturbed as in the 1,200-foot alternative, resulting in a net reduction of approximately 155 acres in vegetation and wildlife habitat displacement over the *applicant's* preferred alternative.

Corinda Los Trancos Canyon - Forefill

This alternative would eliminate an estimated 4 to 5 acres of riparian woodland, of which an *estimated* 0.89 acre could be considered wetlands, in Corinda Los Trancos Canyon.

The stream zone through Corinda Los Trancos has been subject to encroachment by agricultural and other uses, and is of a different quality than the stream zone through Apanolio Canyon. An estimated 3,400 feet of stream habitat would be filled. The impact to upland habitat (approximately 93 acres) would be less extensive than in the 1,200-foot Apanolio Canyon alternative, since a large portion of the Corinda Los Trancos Canyon floor is currently used for agricultural production and has been disturbed by past land use and animal grazing.

Nuff Canyon

Establishment of a landfill in Nuff Canyon would eliminate approximately 5 to 7 acres of riparian woodland, of which 1.74 acres could be considered wetlands by the Corps.

Nuff Canyon has been modified by human activities and the natural diversity of habitat has been altered accordingly. Nuff Creek does not appear to support a fishery resource as does Apanolio Creek. Thus, filling of an estimated 4,200 feet of Nuff Creek would have limited or no impact to fisheries in the Pilarcitos watershed. Natural habitat patterns within the Canyon have been disturbed by development of an access road and clearing of portions of the canyon floor for homesteading, horse and cattle grazing. Approximately 112 acres of upland habitat, primarily coastal chaparral, scrub, and Douglas fir forest, would be eliminated by a landfill in this canyon.

No Action

The estimated 8 to 11 acres of riparian (*including 3.43 acres of wetlands*) and 277 acres of upland habitat would not be lost in the Apanolio Canyon watershed. Impacts to the fishery resource in upper Apanolio Creek would be avoided. Similar impacts to the biological community could occur at the in-county or out-of-county site currently not identified.

Transportation and Circulation

Apanolio Canyon - 850-foot (Reduced Project)

Impacts to local transportation routes, traffic congestion and hazards would be similar to the 1,200-foot alternative. The primary difference between these alternatives is the life-span of the landfill. The direct impacts associated with project operation under this alternative would terminate approximately 68 years earlier than the *applicant's* preferred alternative.

Corinda Los Trancos Canyon - Forefill

Impacts to transportation and circulation would be similar to the Apanolio Canyon 1,200-foot alternative. However, these impacts would not continue beyond the life of the project which would terminate approximately 77 years earlier than the *applicant's* preferred Apanolio Canyon alternative.

Nuff Canyon

Under this project alternative, traffic flow to the landfill would be diverted from the existing access road in Corinda Los Trancos Canyon to the quarry access road in Nuff Canyon. Traffic impacts to Highway 92 would be similar to the 1,200-foot *Apanolio Canyon* alternative; however, operation under this alternative would terminate approximately 66 years earlier than the *applicant's* preferred alternative. Combining both quarry truck traffic and landfill traffic on a single access route to Nuff Canyon would likely require access road and Highway 92 intersection improvements. Increases in the number of truck turns onto and from Highway 92 to the quarry/landfill access road would probably increase traffic congestion and accident potential. Truck turning activities at the existing Ox Mountain/Highway 92 intersection would be eliminated with this alternative.

No Action

Ox Mountain Sanitary Landfill traffic along Highway 92 would terminate in *October 1990*, upon closure of the existing landfill. Traffic volumes and associated impacts would be distributed to an in-county or out-of-county site.

Air Quality

Apanolio Canyon - 850-foot (Reduced Project)

Impacts to air quality under this alternative would be similar in magnitude to but less in duration than the 1,200-foot alternative. The primary difference from the *applicant's* preferred project is that the life-span of the reduced project alternative is an estimated 68 years less.

Corinda Los Trancos Canyon - Forefill

Impacts to air quality would be similar to the Apanolio Canyon 1,200-foot alternative. The projected life-span of the forefill alternative is 16 years. Thus impacts of this alternative would terminate an estimated 77 years prior to the *applicant's* preferred project.

Nuff Canyon

Impacts to air quality would be similar to the Apanolio Canyon 1,200-foot alternative. However, because the life-span of this project is an estimated 27 years, the impact to air quality would cease approximately 66 years earlier than with the *applicant's* preferred project.

No Action

No increase in fugitive dust, odors, or landfill gases would occur in Apanolio Canyon. These emissions, as well as vehicle emissions associated with delivery of solid waste to Ox Mountain would be diverted to an unidentified in-county site or to an out-of-county location.

Noise

Apanolio Canyon - 850-foot (Reduced Project)

The nature and magnitude of noise impacts under this alternative would be similar to the 1,200-foot alternative but the duration of those impacts would be reduced by an estimated 68 years.

Corinda Los Trancos Canyon - Forefill

Off-site traffic noise impacts for this alternative are similar to those for the 1,200-foot Apanolio Canyon alternative. On-site noise emissions would be confined to the Corinda Los Trancos Canyon area and would continue the pattern established by existing landfill operations for another 16 years - approximately 77 years less than the *applicant's* preferred alternative. Noise impacts in Apanolio Canyon from truck traffic along the landfill access road into Apanolio Canyon and from construction equipment would not occur.

Nuff Canyon

Noise impacts along Highway 92 under this alternative would be similar to the 1,200-foot Apanolio Canyon alternative but would last approximately 66 years less. Noise from truck traffic on the access road to the quarry/landfill could increase intermittent noise exposure at receptors along Highway 92 in the vicinity of the access road. On-site construction/operation noise emissions would not be expected to carry beyond the confines of Nuff Canyon. Noise from trucks using the existing Los Trancos landfill access road and from construction/operation activities at that site would be eliminated.

No Action

No impact to the noise environment in Apanolio Canyon would occur. Noise associated with traffic flow to and from the landfill would cease upon closure of the existing landfill.

Public Health and Safety

Apanolio Canyon - 850-foot (Reduced Project)

Impacts to public health and safety would be similar to those identified under the *applicant's* preferred alternative. The major difference is that this alternative would result in public health and safety impacts to the area for about 68 years less than the *applicant's* preferred alternative.

Corinda Los Trancos Canyon - Forefill

Impacts to public health and safety would be similar to those identified under the *applicant's* preferred alternative. Potential for major fires would be reduced somewhat because of more gentle terrain and less dense vegetation. Impacts to the area would be experienced for about 77 years less than the *applicant's* preferred alternative.

Nuff Canyon

Impacts to public health and safety would be similar to those identified under the *applicant's* preferred alternative. The combined traffic from the landfill and quarry operations using a single intersection on Highway 92 may increase congestion and traffic accidents. Employee safety may also be affected at both the quarry and landfill operations due to increased traffic through the active quarry operation.

No Action

Any additional potential for increases in vector populations or wildland fires in Apanolio Canyon would be avoided. Potential for these impacts would be relocated to the County's alternative site.

Public Facilities and Services

Apanolio Canyon - 850-foot (Reduced Project)

Impacts to public facilities and services would be similar to the 1,200-foot alternative; however, landfill operations would terminate an estimated 68 years prior to the *applicant's* preferred alternative.

Corinda Los Trancos Canyon - Forefill

The forefill alternative would have impacts similar to the 1,200-foot Apanolio Canyon alternative. The 16-year life-span of this alternative is approximately 77 years less than the *applicant's* preferred alternative.

Nuff Canyon

A landfill operation in Nuff Canyon would have impacts similar to the 1,200-foot Apanolio Canyon alternative. The potential impacts resulting from this alternative would cease after 27 years, approximately 66 years prior to the *applicant's* preferred alternative.

No Action

No additional burden to CDEFP would occur from landfill activities in Apanolio Canyon. Burdens to public facilities may occur at the unidentified in-county or out-of-county site.

Cultural Resources

Apanolio Canyon - 850-foot (Reduced Project)

As with the 1,200-foot alternative, no impact to cultural resources is anticipated.

Corinda Los Trancos Canyon - Forefill

As with the 1,200-foot Apanolio Canyon alternative, no impact to cultural resources is anticipated.

Nuff Canyon

Although no field reconnaissance was conducted, no impact to cultural resources is anticipated in Nuff Canyon.

No Action

No impact to cultural resources would be avoided, as no impacts were anticipated from the proposed project. Potential impacts resulting from diverting solid waste to an alternative site within or outside San Mateo County cannot be determined until a site has been identified.

Aesthetics

Apanolio Canyon - 850-foot (Reduced Project)

Aesthetic impacts resulting from this alternative would be restricted to vantage points from the upper portions of the Canyon as with the 1,200-foot alternative. No visual impacts would be observable outside the canyon viewshed with the exception of the haul road over the ridge from the existing Corinda Los Trancos Canyon landfill.

Corinda Los Trancos Canyon - Forefill

This alternative may be visible from the Half Moon Bay area as the elevation of the fill reached its maximum height of 800 feet. The landfill would not be visible from Highway 92.

Nuff Canyon

A landfill in the northern reaches of Nuff Canyon would be visible from vantage points along the canyon rim, and potentially from higher elevations east of the Canyon along Skyline Boulevard. The facility would not be visible from Highway 92. Therefore, impacts to aesthetics would be similar to the Apanolio Canyon alternatives.

No Action

No modification of the natural Apanolio Canyon topography or viewshed characteristics would occur. Impacts to an alternate in-county or out-of-county site cannot be determined at this time.

Plans and Policies

Apanolio Canyon - 850-foot (Reduced Project)

A reduced project in Apanolio Canyon would conform with County planning documents. The permits and environmental documentation prepared for the 1,200-foot alternative would apply, and the County objective of establishing a long-term landfill *would* be met under this alternative.

Corinda Los Trancos Canyon - Forefill

This alternative would conform with County plans and policies since Ox Mountain Ranch is identified as the County's long-term landfill location. Implementation of this alternative would require an amendment to the

existing Use Permit for the Corinda Los Trancos Canyon landfill, and would likely require preparation of a Supplemental EIR and possibly an EIS. The County objective of establishing a long-term landfill would not be met under this alternative.

Nuff Canyon

Nuff Canyon is identified and used as a surface mining area. Establishment of a landfill would require an amendment of the County's Solid Waste Management Plan (1984), preparation of an EIR, and possibly an EIS. Permits required would include coastal development, grading, and solid waste facilities permits. Use of the northern portion of Nuff Canyon prior to removal of the designated mineral resource would conflict with County General Plan goals to protect surface mining operations from competing or conflicting land uses. *The County objective of establishing a long-term disposal site would be met under this alternative.*

No Action

No project in Apanolio Canyon would not conform to the County's planning documents or current long-term goals for expansion of the Ox Mountain facility. Establishment of an in-county disposal site would require environmental review, and permitting actions. Amendment of the County's Solid Waste Management Plan would be required.

Economics

Apanolio Canyon - 850-foot (Reduced Project)

Total cost for construction of the reduced project is \$85.2 million. This cost includes \$5 million for design and permitting and \$80.2 million

for construction. Total cost per cubic yard of compacted refuse resulting from these costs is \$3.09.

Corinda Los Trancos Canyon - Forefill

Total cost for construction of the forefill alternative is \$77.6 million. This cost includes \$4 million for design and permitting and \$73.6 million for construction. Total cost per cubic yard of compacted refuse resulting from these costs is \$4.49.

Nuff Canyon

Total costs for construction of the forefill alternative is \$99.8 million. This cost includes \$4.5 million for design and permitting and \$95.3 million for construction. Total cost per cubic yard of compacted refuse resulting from these costs is \$3.30.

No Action

Cost of locating, evaluating, permitting, and constructing a landfill at another site within San Mateo County, or the actual cost associated with out-of-county disposal cannot be accurately determined at this time.

Table 1.3-1. Comparison of Alternatives

Impact Area	Apanolio Canyon (1,200-foot)	Apanolio Canyon (150-foot)	Corinda Los Trancos Canyon (Forefill)	Nuff Canyon	No Action
Geology, Soils, and Seismicity	<ul style="list-style-type: none"> - Permanent modification of Apanolio Canyon topography. - Potential erosion and sedimentation in Apanolio Creek. Erosion and sediment control measures would be implemented to reduce impact. - Potential for landslides during project construction and operation. Slopes would be stabilized to prevent failures that could affect water quality or impair landfill operations. - Strong ground shaking during an earthquake could damage landfill liner, subdrain or leachate collection system. Facilities would be designed to withstand the maximum probable earthquake. - Increase in flood flows in Apanolio Creek. 	<ul style="list-style-type: none"> - Permanent modification of Apanolio Canyon topography to a lesser degree. - Potential erosion and sedimentation in Apanolio Creek. Erosion and sediment control measures would be implemented to reduce impact. - Potential for landslides during project construction and operation. Slopes would be stabilized to prevent failures that could affect water quality or impair landfill operations. - Strong ground shaking during an earthquake could damage landfill liner, subdrain or leachate collection system. Facilities would be designed to withstand the maximum probable earthquake. - Increase in flood flows in Apanolio Creek. 	<ul style="list-style-type: none"> - Permanent modification of Corinda Los Trancos Canyon topography. - Potential erosion and sedimentation in Corinda Los Trancos Creek. Erosion and sedimentation control measures would be implemented to reduce impact. - Landslide potential but not as great as in Apanolio Canyon. Slopes would be stabilized as necessary. - Strong ground shaking during an earthquake could damage landfill liner, subdrain or leachate collection system. Facilities would be designed to withstand the maximum probable earthquake. - Increase in flood flows in Corinda Los Trancos Creek. 	<ul style="list-style-type: none"> - Permanent modification of Nuff Canyon topography. - Potential erosion and sedimentation in Nuff Creek. Erosion and sedimentation control measures would be implemented to reduce impact. - Potential for landslides during project construction and operation. Slopes would be stabilized to prevent failures that could affect water quality or impair landfill operations. - Strong ground shaking during an earthquake could damage landfill liner, subdrain or leachate collection system. Facilities would be designed to withstand the maximum probable earthquake. - Increase in flood flows in Nuff Creek. 	<ul style="list-style-type: none"> - No topographic alteration of Apanolio Canyon, or potential increase in erosion. - Seismic risks would be avoided in Apanolio Canyon. - Similar geologic impacts could occur at unidentified site. - No impact to Apanolio Creek flows, sediment loads, or beneficial uses would occur. - Hydrologic impacts at unidentified site could be similar.
Hydrology and Water Quality	<ul style="list-style-type: none"> - Potential increase in stream sediment loads. Clay fraction could increase turbidity. Erosion and sediment control measures would be implemented and would be effective in removing sands/silts. 	<ul style="list-style-type: none"> - Potential increase in stream sediment loads. Clay fraction could increase turbidity. Erosion and sediment control measures would be implemented and would be effective in removing sands/silts. 	<ul style="list-style-type: none"> - Potential increase in stream sediment loads. Clay fraction could increase turbidity. Erosion and sediment control measures would be implemented and would be effective in removing sands/silts. 	<ul style="list-style-type: none"> - Potential increase in stream sediment loads. Clay fraction could increase turbidity. Erosion and sediment control measures would be implemented and would be effective in removing sands/silts. 	

Table 1.3-1. Comparison of Alternatives (continued)

Impact Area	Apanolio Canyon (1,200-foot)	Apanolio Canyon (850-foot)	Corinda Los Trancos Canyon (Forefill)	Nuff Canyon	No Action
Hydrology and Water Quality (continued)	<ul style="list-style-type: none"> - Potential for ground and/or surface water degradation from leachate migration. Landfill facilities would be designed to prevent leachate migration. Contingency plan would conform with Title 23, Subchapter 15 requirements. 	<ul style="list-style-type: none"> - Potential for ground and/or surface water degradation from leachate migration. Landfill facilities would be designed to prevent leachate migration. Contingency plan would conform with Title 23, Subchapter 15 requirements. 	<ul style="list-style-type: none"> - Potential for ground and/or surface water degradation from leachate migration. Landfill facilities would be designed to prevent leachate migration. Contingency plan would conform with Title 23, Subchapter 15 requirements. 	<ul style="list-style-type: none"> - Potential for ground and/or surface water degradation from leachate migration. Landfill facilities would be designed to prevent leachate migration. Contingency plan would conform with Title 23, Subchapter 15 requirements. 	
	<ul style="list-style-type: none"> - Elimination of 8-11 acres of riparian habitat, including about 3.43 acres of Corps designated wetlands, and 277 acres of upland habitat. Mitigation plan is intended to compensate for habitat loss. 	<ul style="list-style-type: none"> - Elimination of 7-10 acres of riparian habitat, including about 2.7 acres of Corps designated wetlands, and 121 acres of upland habitat. Mitigation plan would be developed to compensate for habitat loss. 	<ul style="list-style-type: none"> - Elimination of 4-5 acres of riparian habitat, including about 0.89 acres of Corps designated wetlands, and 93 acres of upland habitat. Mitigation plan would be developed to compensate for habitat loss. 	<ul style="list-style-type: none"> - Elimination of 5-7 acres of riparian habitat, including 1.74 acres of Corps designated wetlands, and 112 acres of upland habitat. Mitigation plans would be developed to compensate for habitat loss. 	<ul style="list-style-type: none"> - No impact to wetland, riparian, or upland habitat.
Biology	<ul style="list-style-type: none"> - Filling of approximately 5,600 feet of aquatic habitat. Mitigation plan includes aquatic resource enhancement. 	<ul style="list-style-type: none"> - Filling of approximately 4,200 feet of aquatic habitat. Mitigation plan includes aquatic resource enhancement. 	<ul style="list-style-type: none"> - Filling of approximately 3,400 feet of aquatic habitat. Mitigation plan includes aquatic enhancement. 	<ul style="list-style-type: none"> - Filling of approximately 4,200 feet of stream with no fishery value. Mitigation plan includes aquatic enhancement. 	<ul style="list-style-type: none"> - Upper Apanolio Creek fisheries would not be affected.
	<ul style="list-style-type: none"> - No impact to endangered species. 	<ul style="list-style-type: none"> - No impact to endangered species. 	<ul style="list-style-type: none"> - No impact to endangered species. 	<ul style="list-style-type: none"> - No impact to endangered species. 	<ul style="list-style-type: none"> - Impacts to biological resources at unidentified site could be similar.
Transportation and Circulation	<ul style="list-style-type: none"> - Continuation of existing landfill truck traffic impacts on Highway 92. 	<ul style="list-style-type: none"> - Continuation of existing landfill truck traffic impacts on Highway 92. 	<ul style="list-style-type: none"> - Continuation of existing landfill truck traffic impacts on Highway 92. 	<ul style="list-style-type: none"> - Continuation of existing landfill truck traffic impacts on Highway 92. 	<ul style="list-style-type: none"> - Landfill traffic impacts to Highway 92 would cease in 1989.
	<ul style="list-style-type: none"> - Increase in landfill traffic in future years, continuing through the life of the facility. Current truck access restrictions would continue to reduce peak hour traffic impacts. 	<ul style="list-style-type: none"> - Increase in landfill traffic in future years, continuing through the life of the facility. Current truck access restrictions would continue to reduce peak hour traffic impacts. Life of facility approximately 68 years less. 	<ul style="list-style-type: none"> - Increase in landfill traffic in future years, continuing through the life of the facility. Current truck access restrictions would continue to reduce peak hour traffic impacts. Life of facility approximately 77 years less. 	<ul style="list-style-type: none"> - Increase in landfill traffic in future years, continuing through the life of the facility. Life of facility approximately 66 years less. 	<ul style="list-style-type: none"> - Landfill traffic would be diverted to unidentified site.

Table 1.3-1. Comparison of Alternatives (continued)

Impact Area	Apanolio Canyon (1,200-foot)	Apanolio Canyon (850-foot)	Corinda Los Trancos Canyon (Forefill)	Nuff Canyon	No Action
Air Quality	<ul style="list-style-type: none"> - No change to existing truck turning movements. 	<ul style="list-style-type: none"> - No change to existing truck turning movements. 	<ul style="list-style-type: none"> - No change to existing truck turning movements. 	<ul style="list-style-type: none"> - Operation would move truck turning onto and from Highway 92 from existing quarry/landfill truck intersection to quarry road. Congestion could cause increased congestion and increase accident potential. 	
	<ul style="list-style-type: none"> - Increase in fugitive dust, gases and odor generation on site. Fugitive dust emissions would be offset after closure of Corinda Los Trancos landfill. 	<ul style="list-style-type: none"> - Increase in fugitive dust, gases and odor generation on site. Fugitive dust emissions would be offset after closure of Corinda Los Trancos landfill. 	<ul style="list-style-type: none"> - Increase in fugitive dust, gases and odor generation on site. Fugitive dust emissions would be offset after closure of Corinda Los Trancos landfill. 	<ul style="list-style-type: none"> - No increases in fugitive dust, odor, or landfill gases would occur in Apanolio Canyon. 	
	<ul style="list-style-type: none"> - Vehicle emissions on and off site would continue, and increase in future years. Life of project would be approximately 68 years less. 	<ul style="list-style-type: none"> - Vehicle emissions on and off site would continue, and increase in future years. Life of project would be approximately 77 years less. 	<ul style="list-style-type: none"> - Vehicle emissions on and off site would continue, and increase in future years. Life of project would be approximately 66 years less. 	<ul style="list-style-type: none"> - Similar impacts would occur at unidentified site. 	
Noise	<ul style="list-style-type: none"> - Continuation of traffic noise contribution along Highway 92. - Slight noise increase at Apanolio Canyon residence. 	<ul style="list-style-type: none"> - Continuation of traffic noise contribution along Highway 92. - Slight noise increase at Apanolio Canyon residence. 	<ul style="list-style-type: none"> - Continuation of traffic noise contribution along Highway 92. - Continuation of existing noise impact to residences near landfill. 	<ul style="list-style-type: none"> - Continuation of traffic noise contribution along Highway 92. - Slight noise increase to residences near intersection with Highway 92. 	<ul style="list-style-type: none"> - No impact to noise environment in Apanolio Canyon would occur. - Noise associated with landfill operation would be diverted to an unidentified site in 1989.
Public Health and Safety	<ul style="list-style-type: none"> - Potential attraction for vectors. Standard operating procedures would minimize problem. 	<ul style="list-style-type: none"> - Potential attraction for vectors. Standard operating procedures would minimize problem. 	<ul style="list-style-type: none"> - Continuation of potential vector problems in Corinda Los Trancos Canyon. Standard operating procedures would continue to minimize problems. 	<ul style="list-style-type: none"> - Potential for vector problems in Nuff Canyon. Standard operating procedures would minimize problems. 	<ul style="list-style-type: none"> - No potential increase in vector populations or wildland fire in Apanolio Canyon from landfill operation.
	<ul style="list-style-type: none"> - Increased potential for wildland fire. Controlled burns/safety training would minimize risk. 	<ul style="list-style-type: none"> - Increased potential for wildland fire. Controlled burns/safety training would minimize risk. 	<ul style="list-style-type: none"> - Continuation of existing fire potential. Controlled burns/safety training would minimize risk. 	<ul style="list-style-type: none"> - Increase in potential for wildland fire. Controlled burns/safety training would minimize risk. 	

Table 1.3-1. Comparison of Alternatives (continued)

Impact Area	Apanollo Canyon (1,200-foot)	Apanollo Canyon (850-foot)	Corinda Los Trancos Canyon (Forfill)	Nuff Canyon	No Action
Public Facilities and Services	<ul style="list-style-type: none"> - Potential increased burden on ODFP fire personnel and equipment in event of a wildland fire. 	<ul style="list-style-type: none"> - Potential increased burden on ODFP fire personnel and equipment in event of a wildland fire. 	<ul style="list-style-type: none"> - Continuation of existing fire potential and reliance on ODFP fire personnel. 	<ul style="list-style-type: none"> - Potential increased burden on ODFP fire personnel and equipment in event of a wildland fire. 	<ul style="list-style-type: none"> - No additional potential burden to ODFP from wildland fires. - Undetermined impact to public facilities at unidentified site.
Cultural Resources	<ul style="list-style-type: none"> - No impact on cultural resources expected. 	<ul style="list-style-type: none"> - No impact on cultural resources expected. 	<ul style="list-style-type: none"> - No impact on cultural resources expected. 	<ul style="list-style-type: none"> - No impact on cultural resources expected. 	<ul style="list-style-type: none"> - No impact is avoided in Apanollo Canyon. - Potential impact at unidentified site cannot be determined.
Aesthetics	<ul style="list-style-type: none"> - Modification of natural landscape in Apanollo Canyon. - Site visible only from within the canyon or from higher elevations along the canyon rim. 	<ul style="list-style-type: none"> - Less extensive modification of canyon characteristics. - Site visible only from within the canyon or from higher elevations along the canyon rim. 	<ul style="list-style-type: none"> - Modification of natural landscape in Lower Corinda Los Trancos Canyon. - Landfill may be visible from Half Moon Bay area. 	<ul style="list-style-type: none"> - Modification of natural landscape in Nuff Canyon. - Visible from within canyon and from higher elevations east of the canyon. 	<ul style="list-style-type: none"> - No impacts to Apanollo Canyon viewshed. - Impact to aesthetics at unidentified site cannot be determined.
Plans and Policies	<ul style="list-style-type: none"> - Alternative would conform with existing plans and policies. - Site would meet County goal for long term disposal. - All County permits in place. 	<ul style="list-style-type: none"> - Alternative would conform with existing plans and policies. - Site would meet County objective of long term disposal. - All County permits in place. 	<ul style="list-style-type: none"> - Alternative would conform with existing plans and policies. - Site would not meet County objective of long-term disposal. - EIR and possible EIS preparation, use, and other permits required. 	<ul style="list-style-type: none"> - Alternative would require amendment to County Solid Waste Management Plan. - Site would meet County goal for a long-term disposal site. - EIR and possible EIS preparation, use, and other permits required. 	<ul style="list-style-type: none"> - Project at unidentified site would not conform with County planning goals and documents. - Environmental review and permitting at unidentified site would be required.
Economics	<ul style="list-style-type: none"> - Total project construction cost - \$129.4 million. - Cost per cubic yard of refuse - \$1.05. 	<ul style="list-style-type: none"> - Total project construction cost - \$85.2 million. - Cost per cubic yard of refuse - \$3.09. 	<ul style="list-style-type: none"> - Total project construction cost - \$77.6 million. - Cost per cubic yard of refuse - \$4.49. 	<ul style="list-style-type: none"> - Total project construction cost - \$99.8 million. - Cost per cubic yard of refuse - \$3.30. 	<ul style="list-style-type: none"> - Economic impact of disposal of solid waste at unidentified site cannot be determined.

2.0 INTRODUCTION

Browning-Ferris Industries of California, Inc. (BFI) is proposing expansion of the Ox Mountain Sanitary Landfill, located in San Mateo County, California. The project would allow expansion of the facility into Apanolio Canyon, and would provide for the municipal solid waste disposal needs of San Mateo County for an estimated 93 years.

The proposed expansion would fill the northern portion of Apanolio Canyon including a portion of Apanolio Creek, a perennial stream in the Pilarcitos Creek watershed, and would eliminate 3.43 acres of wetland habitat. To allow this filling to occur, BFI is required to obtain a permit under Section 404 of the Clean Water Act from the U.S. Army Corps of Engineers (Corps). Upon application for the required permit, the Corps determined that an Environmental Impact Statement (EIS) would be required as part of the permit application. An EIS is an environmental document required under the National Environmental Policy Act (1969). On August 18, 1987, the Corps published a notice of intent (NOI) in the Federal Register to prepare a Draft EIS for the proposed expansion.

An Environmental Impact Report (EIR), an environmental document required under the California Environmental Quality Act (CEQA), was prepared for the Apanolio Canyon expansion by Thomas Reid Associates, Palo Alto, California. The Final EIR for the project was certified by San Mateo County in February 1984. The content of this EIS is based upon the environmental analysis contained in the 1984 EIR, with updating of information as appropriate.

Disposal locations for San Mateo County solid wastes have been a major issue for more than 25 years. Beginning in 1962, the County has studied and planned for its solid waste disposal needs. A brief history of the County's municipal landfill facilities, a summary of the County's Solid Waste Management Plan, the purpose and need for the proposed action, and a brief description of the regulatory framework for the project are presented in the following sections of this chapter. This introductory material is intended to provide the readers of this EIS with the background and current conditions in the solid waste management field in San Mateo County.

2.1 County Landfill History

The availability of municipal landfill facilities to the County of San Mateo has steadily decreased in the past 25 years. Since 1962, a total of 19 landfills have been in operation, and only three of these facilities are currently operating. Current County landfill status is summarized in Table 2.1-1.

Table 2.1-1. San Mateo County Landfill History

Landfill	Source ¹	Status
Pacifica	Scav./Public	Closed
Mussel Rock	Scav.	Closed
Junipero Serra (Colma)	Public	Closed
Hillside (Colma)	Public	Open for public only
Brisbane	Scav.	Closed
Sierra Point	Scav.	Closed
S. San Fran.	Scav./Public	Closed
Burlingame	Public	Closed
San Mateo	Public	Open for compost materials ² only
Belmont	Public	Closed
Redwood City	Scav.	Closed
S. Co. District	Scav./Public	Closed
Menlo Park #2 (Marsh Road)	Scav.	Closed
La Honda	Public	Closed
Old Pescadero	Public	Closed
Pescadero	Scav./Public	Closed - Currently a small volume transfer station
HMB - Rubbish	Public	Closed
HMB	Scav.	Closed
Ox Mountain	Scav./Public	Open - only Scav. landfill in San Mateo County

- ¹ Scavenger (Scav.) - Scavenger companies (collection companies) are licensed franchise operators that collect municipal wastes from commercial and residential areas.
Public - Public wastes are household wastes that are delivered to the landfill by private citizens.

- ² Compost materials - Compost materials would include household wastes such as lawn and shrub clippings, etc.

Source: San Mateo County Solid Waste Management Plan, 1984.

Between 1962 and 1974 disposal operations conducted at eight landfills located in Pacifica, Brisbane (two sites), South San Francisco, Redwood City, Belmont, La Honda and Half Moon Bay were terminated. In 1975 the

County replaced its small Pescadero facility (Old Pescadero) located along Pescadero Road with a modern landfill on a 50-acre site on Bean Hollow Road (Pescadero). This facility has since been closed and replaced with a small volume transfer station. In 1976 the County closed its Half Moon Bay (HMB) landfill to coincide with the opening of the nearby privately owned Ox Mountain Sanitary Landfill. The Mussel Rock landfill in Daly City was closed by order of the California Regional Water Quality Control Board (RWQCB) in 1977, and in 1982 the City of San Mateo modified its landfill operation to a compost only landfill. The Junipero Serra (Colma) landfill closed in 1983, leaving only the Hillside facility in this area open for public disposal. The Marsh Road facility was closed in 1984, coincident with the opening of the San Carlos transfer station, followed by the closure of the landfill at Burlingame in 1986.

Of the landfills closed during this time period, nine of the sites were available for refuse disposal by scavenger (collection) companies operating within the County. Closure of the smaller landfills increased the demand on the Ox Mountain landfill, which has become the County's primary facility as planned and defined as a County goal in the County's Solid Waste Management Plan. The need for local disposal sites for scavenger companies was fulfilled by establishment of four major transfer stations located throughout the county. Currently major transfer stations are in operation in Daly City, South San Francisco, San Bruno, and San Carlos. Waste is delivered to these transfer stations by collection trucks and the public,

and is then hauled to the Ox Mountain sanitary landfill by larger, more efficient transfer trucks.

Plan Development

Pursuant to the *Nejedly-Z'berg-Dills* Solid Waste Management and Resource Recovery Act of 1972, San Mateo County prepared a Solid Waste Management Plan. The Plan was completed in November 1975 and was revised in both 1977 and 1983. The primary purposes of the Plan are to project the amount of solid waste that will be generated in the County through the year 2000, to identify adequate sites and facilities for collection and disposal of this waste and to encourage alternate means of handling solid waste disposal, including resource recovery. The Solid Waste Management Plan was first revised in May, 1977 to include an implementation schedule and the Northwest Regional Transfer Station. It also recognized the closing of the Mussel Rock Disposal Site and the opening of the Ox Mountain Sanitary Landfill. The California Waste Management Board approved the Plan, as revised, in November, 1977. In 1983, the County Solid Waste Management Plan was revised to follow more closely the State's guidelines and to respond to additional concerns. Additional information developed or gathered by the County Department of Public Works with the advice and guidance of the Regional Planning Committee/Solid Waste Advisory Committee was also incorporated into the plan.

The purpose of the 1983 revisions was to provide a self-contained, comprehensive solid waste management plan for all solid waste produced in

San Mateo County (as well as for those which are produced in other counties, but which may be disposed of in San Mateo County) during the next 20 years.

Plan Goals

The basic goal of the San Mateo County Solid Waste Management Plan is to provide management of solid waste in the most efficient and economical manner that will provide adequate services, protect public health, prevent the creation of nuisances, reduce waste generation, conserve natural resources and energy, provide for maximum resource recovery from solid waste, and enhance the beauty and quality of the environment.

The San Mateo County Solid Waste Management Plan relies on a combination of public and private efforts to achieve solid waste management objectives. The Plan relies primarily on private industry to provide the major solid waste facilities such as landfills, transfer stations, and energy recovery plants. Under the Plan, local governmental entities have the primary responsibility for providing small volume transfer stations to serve the general public's desire for a convenient method of disposing of household refuse.

The Plan envisions a decreasing reliance on small landfills, and relying on the Ox Mountain facility to accommodate virtually all Class III (non-hazardous) waste generated in San Mateo County. Solid waste would be delivered to the facility via transfer trucks from transfer stations in Daly City, South San Francisco, San Bruno, and a fourth station in the Redwood City area which was defined as a key component of the overall Plan. The latter transfer station, constructed on the San Carlos/Redwood City

boundary, has been in operation since 1984. The Plan (1984) foresees future facilities supplementary to the Ox Mountain Sanitary Landfill and major transfer stations. These include two landfills in Colma (Hillside and Junipero Serra) and one in Pescadero, together with a number of rubbish collection points as desired by individual cities. The Pescadero facility has been converted to, and currently exists as a small volume transfer station and the Colma-Junipero Serra landfill has been closed.

2.2 History of Proposed Action

In the early 1960s, San Mateo County commissioned a study, conducted by Wilsey, Ham & Blair, to identify and evaluate potential future landfill sites. At the time of the study, a regionwide or countywide facility was not strongly anticipated. The objectives of this study and the sites evaluated are presented in Chapter 3.0 of this report.

Within the Half Moon Bay service area, four potential landfill sites were examined including Corinda Los Trancos Canyon, a canyon along Higgins Road, Arroyo de en Media Creek Canyon, and Arroyo Leon Canyon. Based on engineering and environmental evaluation criteria, the Corinda Los Trancos site was identified as a feasible location for refuse disposal in this service area. The owner of the site applied for permits for a large landfill facility that encompassed both Corinda Los Trancos and Apanolio Canyons. In 1965, use and grading permits for the Corinda Los Trancos Canyon site were granted by the county. A Cities/County site selection committee recommended that all of Ox Mountain Ranch be held in reserve for a

regionwide disposal facility as a preferable approach to siting and development of numerous smaller landfills in the region. The property was purchased by San Mateo County Scavenger Company (later BFI of San Mateo) to hold it in reserve for future development.

In 1974 Wilsey, Ham & Blair prepared an EIR for the proposed Ox Mountain Sanitary Landfill. Upon completion and certification of the EIR, and attainment of other necessary permits, the Corinda Los Trancos Canyon site was prepared and began operation in April 1976.

The original landfill was approved with the expectation and understanding that expansion of the landfill into Apanolio Canyon would occur when the Corinda Los Trancos Canyon facility neared capacity. The Corinda Los Trancos Canyon landfill has a design capacity of 7.5 million cubic yards which is anticipated to be reached in 1989.

In 1983, BFI applied for a County use permit to allow development of Apanolio Canyon as an extension of the Ox Mountain landfill operation. The county prepared an Environmental Impact Report (EIR) for the project and certified the Final EIR in 1984. The use permit and coastal development and grading permits were applied for and approved by the county.

In 1986, a study of the wetland habitat in Apanolio Canyon was conducted in response to concerns raised by state and federal agencies and to define the jurisdictional limits of the U.S. Army Corps of Engineers under Section 404 of the Clean Water Act. *This study resulted in a Corps determination that 3.43 acres of the proposed project area was subject to its jurisdiction.* In conjunction with Section 404 permit requirements, the

Corps determined that preparation of an Environmental Impact Statement (EIS) would be required.

In 1987, the San Mateo County Department of Public Works investigated alternative sites to Apanolio Canyon to determine if feasible sites existed that would result in fewer environmental impacts while maintaining the objectives of the County Solid Waste Management Plan. The results of this analysis are presented in Chapter 3.0 of this report.

2.3 Purpose and Need

The Ox Mountain Sanitary Landfill, owned and operated by Browning-Ferris Industries of California, Inc., is the primary recipient of municipal waste in San Mateo County. The landfill began receiving waste in 1976, and it is anticipated that it will reach its design capacity in *October 1990*. The San Mateo County Solid Waste Management Plan (1984) identifies the Ox Mountain Ranch as the location for the County's primary solid waste disposal site.

Currently only three landfills are in operation in San Mateo County. These facilities are located in San Mateo, Hillside (Colma) and at Ox Mountain Ranch. These landfills and their operational status are presented in Table 2.3-1.

Table 2.3-1. Landfills in San Mateo County (1987)

<u>Landfill</u>	<u>Type</u>	<u>Annual Input (tons)</u>	<u>Percentage of County Waste Stream</u>	<u>Anticipated Closure Date</u>
Hillside (Colma)	Class III (Public)	55,900	7.6	1998(?)
San Mateo	Class III (Public - Compost Only)	6,500	0.9	?
Ox Mountain ¹	Class III (Public - Scavenger)	673,400	91.5	1989

¹ In 1982, prior to the closure of the Marsh Road Landfill, annual input to Ox Mountain was 182,000 tons (29.9% of county wastes).

Source: San Mateo County Department of Public Works (August 31, 1987)

Of these landfills, only the Ox Mountain facility accepts waste collected by scavenger companies. The Colma-Hillside facility only accepts waste delivered to the site by the public. The San Mateo facility is only open to public disposal of compostable materials (e.g., lawn and garden wastes). Scavenger companies servicing areas of San Mateo County are responsible for collection of approximately 69% of the municipal solid waste generated within the county (Laakso, pers. com., August 31, 1987). Currently five transfer stations in Daly City, South San Francisco, San Bruno, San Carlos, and Pescadero receive wastes from local collectors (scavenger companies) and/or the public. This waste is loaded into 26-ton transfer trucks for transport to the Ox Mountain Sanitary Landfill for disposal.

2.4 Regulatory Framework

The proposed action potentially impacts resources under the purview of several regulatory agencies and requires project review and permitting actions by federal, state and local agencies. The involvement of agencies and the interaction between these agencies is briefly defined in the following discussion. The discussion is presented by agency type (i.e., federal, state, and local) and is summarized in Table 2.4-1.

Federal Agencies

United States Army Corps of Engineers (Corps)

The United States Army Corps of Engineers (Corps) maintains regulatory jurisdiction over U.S. waters under Section 404 of the Clean Water Act, 33 U.S.C. 1344. Under this act, and regulations promulgated thereunder, a permit is required for the discharge of fill materials into waters of the United States and all adjacent wetlands. San Mateo County is within the San Francisco District of the Corps.

The proposed action would ultimately destroy 3.43 acres of lands designated as wetlands by the Corps subject to its jurisdiction, thus requiring a Section 404 permit. An Environmental Impact Statement is required under the National Environmental Policy Act (1969) when the proposed action is expected to have significant effect upon the quality of the human environment.

The primary concerns of the Corps are the impacts of filling Apanolio Creek and the loss of adjacent wetlands. As a part of the permit process, the Corps engages in a public interest review which encompasses many factors including, but not limited to, potential water quality impacts to other

water resources from the project discharges, socioeconomics, cultural resources, and land use. *The 1978 amendments to the Endangered Species Act of 1973, 16 U.S.C., 1531, et seq., require the Corps assess potential impacts of a proposed action on recognized endangered or threatened species.*

United States Fish and Wildlife Service (USFWS)

The U.S. Fish and Wildlife Service (USFWS), under the Fish and Wildlife Coordination Act of 1958, must be consulted on federally funded or permitted projects. USFWS does not have permit authority for the proposed action, but is a commenting agency to the Corps.

The USFWS provides technical consultation to the Corps during the Section 404 permit process to assess the potential impacts of a proposed action, and feasibility and methods of mitigating impacts to fish and wildlife resources.

United States Environmental Protection Agency (EPA)

The U.S. Environmental Protection Agency (EPA) has delegated much of its responsibility regarding protection of the environment to various state agencies including the California Air Resources Board, California Water Resources Control Board, and California Department of Health Services.

The San Francisco Bay Area is under the jurisdiction of Region IX of the EPA. The primary role of the EPA in this project is the review of this EIS and the Corps permit recommendation for compliance with Federal Guidelines for Specification of Disposal Sites for Dredged or Fill Material, promulgated pursuant to Section 404(b)(1) of the Clean Water Act. The review by the EPA will focus on impacts to water quality, fisheries and

wildlife, endangered species, and wetlands. Under Section 404(b)(1), the analysis of practicable project alternatives presented in the EIS will be evaluated.

State Agencies

California Regional Water Quality Control Board (RWQCB), San Francisco

Bay Region

The Dickey Act of 1949 created the State Water Resources Control Board (SWRCB). There are also nine Regional Water Quality Control Boards (RWQCBs) which were formed pursuant to the Porter-Cologne Water Quality Control Act. The California Water Resources Control Board and its nine regional boards are responsible for ensuring protection of the quality of waters and their beneficial uses within the state. The board has jurisdiction over disposal operations if they may affect water quality. The SWRCB also manages water rights, statewide water quality problems and appeals from the regional boards.

The RWQCB will develop Waste Discharge Requirements, Conditions, Specifications and a Self-Monitoring Program (SMP) for the Apanolio Canyon expansion project. These requirements and specifications are intended to address present and future protection of ground water quality and will be incorporated into the permit granted by San Mateo County Office of Environmental Health. The RWQCB also must certify the Corps Section 404 permit pursuant to Section 401 of the Clean Water Act based upon findings by the RWQCB that the waters of the state will be protected and that losses of beneficial uses that cannot be protected are acceptably mitigated.

California Department of Fish and Game (CDFG)

The California Department of Fish and Game (CDFG) has authority to comment on projects potentially impacting the State's fish and wildlife resources under the State Fish and Game Code, the State Endangered Species Act and the Fish and Wildlife Coordination Act. San Mateo County is located in CDFG's Region 3 which is headquartered in Yountville.

CDFG will require a Stream Alteration Agreement for the filling of a portion of Apanolio Creek by the proposed action. The Stream Alteration Agreement sets forth the requirements of CDFG for activities affecting the stream bed, and recommends ways to minimize impacts. Recommendations in the Agreement will include mitigation for minimizing disturbance of habitat and protection of downstream habitat and water quality. The agreement will be a part of the Solid Waste Facility Permit and compliance with its stipulations will be monitored by San Mateo County Office of Environmental Health.

Bay Area Air Quality Management District (BAAQMD)

The California Air Resources Board (CARB) sets air quality and emission standards and model rules for the Air Quality Management Districts (AQMDs) based on EPA rules promulgated under the Clean Air Act. San Mateo County is under the purview of the Bay Area Air Quality Management District (BAAQMD).

The proposed action would require a Permit to Operate issued by the BAAQMD. This permit sets forth requirements for air emissions from equipment to be used during operation of the Apanolio landfill.

California Coastal Commission (CCC)

The California Coastal Commission (CCC) oversees development activities within the California coastal zone. In San Mateo County, development activities in the coastal zone are also guided by the Local Coastal Program (LCP), certified by the CCC in 1980. This certification transferred permit authority for development in the coastal zone to the County. However, under the Coastal Zone Management Act, the CCC must find that issuance of the 404 permit is consistent with the California Coastal Act and the Local Coastal Program (LCP).

California Waste Management Board (CWMB)

The California Waste Management Board (CWMB), as the lead agency for implementation of the Federal Resource Conservation and Recovery Act, has the responsibility of approving the County's Solid Waste Management Plan and reviews the Solid Waste Facilities Permit (SWFP). The Solid Waste Facilities Permit is issued and enforced by the County Office of Environmental Health (CEH). Thus, the primary responsibilities for solid waste management fall to CEH which acts as the local enforcement agency for the CWMB. The CWMB issued a provisional SWFP (#41-AA-002) for Apanolio Canyon on December 10, 1986.

Local Agencies

San Mateo County

San Mateo County has several permitting requirements for the Apanolio Canyon expansion project. The County has already processed and issued all of the permits for the proposed action. In compliance with the California

Environmental Quality Act (CEQA) the County prepared an Environmental Impact Report (EIR) for the Apanolio Canyon expansion. This EIR was certified in February 1984. Upon completion of the EIR process, the County issued Use Permit UP-82-3 and Coastal Development Permit CDP-82-4 for the landfill expansion into Apanolio Canyon. A grading permit (GP-86-7) was issued for the project in 1986.

The State Coastal Commission transferred coastal permit authority to the County by certifying the San Mateo County Local Coastal Program (LCP), the document designed to implement the Coastal Act of 1976.

The County Office of Environmental Health (CEH) acts as the local enforcement agency (LEA) for the State Waste Management Board and issues the Solid Waste Facility Permit. The permit will require that the landfill be operated in conformance with all state and local regulations, including the State Minimum Standards for Solid Waste Handling and Disposal, the Waste Discharge Requirements, the County Use Permit and the County Coastal Development Permit. Permits and agreements granted by regulatory agencies will all be attached to the permit given by CEH. CEH also conducts a routine inspection program which addresses all potential environmental problems related to the landfill operation, and assures that conditions of the permit are not violated.

Table 2.4-1. Summary of Regulatory Framework for Apanolio Canyon Expansion

<u>Agency</u>	<u>Action</u>	<u>Project Concerns</u>
<u>Federal</u>		
USACE	Section 404 Permit	Filling of Stream Wetland habitat, water quality, etc.
USFWS	Commenting (Section 404)	Stream and upland habitat, endangered species
U.S. EPA	Commenting and Supervisory Authority (Section 404)	Delegated authorities to State Agencies
<u>State</u>		
RWQCB	Waste Disch. & Monitoring Requirements, Water Quality Certification (Section 401), NPDES (Section 402)	Water quality
CDFG	Stream Alt. Agreement	Stream mod., habitat, endangered species, etc.
CWMB	Solid Waste Facilities Permit	Solid waste disposal practices
CCC	Section 404 Consistency with California Coastal Act	Federal Coastal Zone management
BAAQMD	Permit to Operate	Air emissions/air quality

Table 2.4-1 (continued)

<u>Agency</u>	<u>Action</u>	<u>Project Concerns</u>
<u>Local</u>		
County of San Mateo	Use, Coastal Dev., Grading, Solid Waste Facility Permits, CEQA Compliance	Public Health and Safety, Environmental Protection, Land Use Plans and Policies

3.0 PROPOSED ACTION AND ALTERNATIVES

3.1 Introduction

Since the early 1960s, the County of San Mateo has identified numerous locations within the County for potential development of municipal solid waste disposal sites (letter from San Mateo County to Col. Yanagihara, U.S. Army Corps, dated October 16, 1987 - Appendix C). Sites identified during this process have included existing landfill facilities, as well as new locations for landfill development.

The first county-wide site identification study was completed in 1963. This study, prepared for the County by Wilsey, Ham & Blair, subdivided the county into seven service areas (Daly City, Pacifica, Half Moon Bay, Pescadero, La Honda, North Bayside, and South Bayside) and identified 19 potential landfill locations.

In 1987, the San Mateo County Department of Public Works conducted an alternative site analysis study for the proposed Apanolio Canyon expansion project. This study, using updated siting criteria, evaluated potential sites within the county, as well as sites outside the county. The result of this screening process, presented in Section 3.4, identified the candidate sites that should be considered viable alternatives for planning purposes and for evaluation by this Draft EIS.

A detailed description of each of the alternatives in the final array of sites is presented in Section 3.5.

3.2 Landfill Site Selection Criteria

The criteria used in the landfill site selection process included physical, environmental, and economic factors. These selection, or screening criteria, were applied to each of the sites identified. A listing of site screening criteria used in the 1963 and 1987 site selection studies is presented in Table 3.2-1.

Table 3.2-1. Landfill Site Selection Criteria¹

	<u>1963</u>	<u>1987</u>
<u>Physical/Engineering</u>		
Ultimate Capacity of Site (Life-span)	x	x
Depth of fill possible	x	x
Acreage required	x	x
<u>Environmental</u>		
Proximity to Urban Development	x	x
Compatibility with surrounding land uses	x	x
Natural and artificial barriers	x	x
Probability of community resistance	x	x
Development relative to bayside and coastal wetlands	-	x
Proximity to Holocene faults	-	x
Water quality	-	x
<u>Economic</u>		
Acquisition costs	x	x
Development costs	x	x
Average haul costs	x	x

¹ See Appendix C for explanation of selection criteria

As indicated in Table 3.2-1, criteria that were not considered in the 1963 site survey were proximity to bayside and coastal wetland areas and Holocene faults and water quality. Concerns relating to the potential

environmental impacts of numerous small landfills in the county directed county officials to study and identify a central, large capacity landfill site capable of accepting all solid wastes generated within San Mateo County for a reasonable period of time. The identification criteria for sites in the 1963 study did not include this siting objective. The County Solid Waste Management Plan (1984) identifies the need to select a large capacity landfill site and outlines the development of the County's solid waste management system with this criteria as its focal point.

3.3 Potential Landfill Sites

Site Identification Studies

1963 Waste Disposal Site Survey

To adequately identify potential landfill sites that meet the needs of San Mateo County, the 1963 site survey had several objectives:

- To determine and locate a sufficient number of waste disposal sites throughout the County which are adequate in capacity, acceptable in character, and so located as to economically serve the County of San Mateo and the City and County of San Francisco until the year 2000.
- To develop logical boundaries and population estimates for the various refuse disposal service areas and to compute the volume of waste for each such service area.
- To select the waste disposal sites on the basis of capacity of each site, the amount of site preparation required, access to each site, standards of operation and physical operating equipment required, control procedures required and the amount of cover material available for each site, proximity of each site to the area which it is to serve, the original land cost, cost of site preparation, and operational cost for each site.
- To prepare a plan of waste disposal sites based upon geographical, physical, economic and social factors, and to indicate the possibilities for reuse of such sites.

Using the above objectives and the 1963 selection criteria presented in Section 3.2, 19 landfill sites were identified by this study. These sites are presented in Table 3.3-1, and their locations are indicated in Figure 3.3-1.

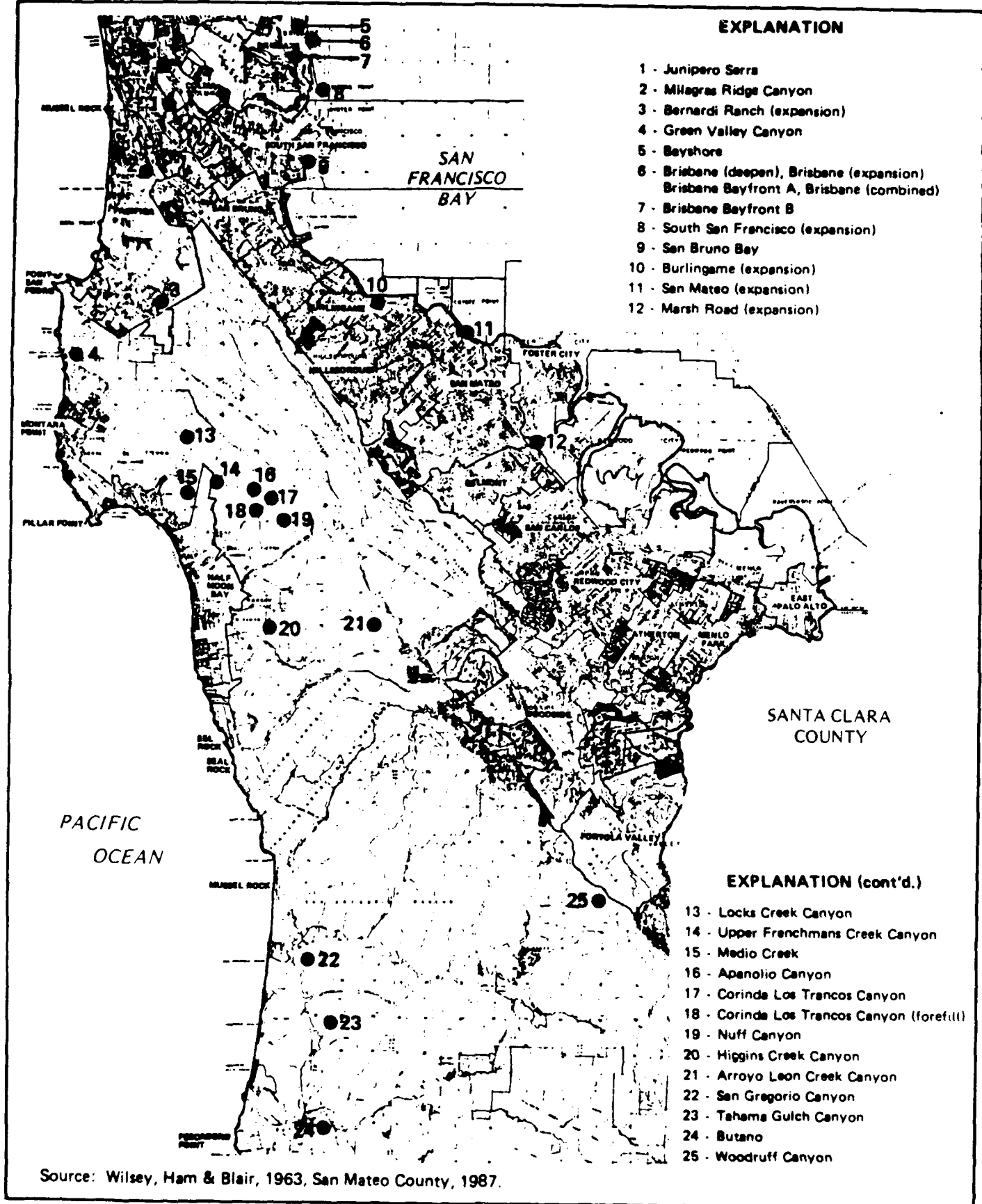
Table 3.3-1. Potential Landfill Locations (1963)

- Tahama Gulch Canyon
- Arroyo Leon Creek Canyon
- Butano
- San Gregorio Canyon
- Corinda Los Trancos Canyon
- Green Valley Canyon
- Bernardi Ranch (expansion)
- Milagras Ridge Canyon
- Brisbane Bayfront B
- Junipero Serra
- Bayshore
- Burlingame (expansion)
- San Mateo (expansion)
- Medio Creek
- Higgins Creek Canyon
- Marsh Road (expansion)
- South San Francisco (expansion)
- San Bruno Bay
- Brisbane (expansion)
- Brisbane (deepen)
- Brisbane Bayfront A
- Brisbane (combined A & B and deepen)

Source: Wilsey, Ham & Blair, 1963.

1987 Site Identification Study

In 1987, the San Mateo County Department of Public Works conducted a site identification study for potential alternatives to the planned expansion of the Ox Mountain facility into Apanolio Canyon. Using the criteria presented in Section 3.2, the County identified three site



locations within the county, as well as four alternative locations outside county boundaries. In addition, BFI prepared an alternative site analysis report in 1987 that included the information generated by the County Department of Public Works study, as well as information on three additional locations owned or partially owned by BFI.

Potential Landfill Sites Within San Mateo County

The site identification studies conducted in 1987 by the San Mateo County Department of Public Works and Browning Ferris Industries of California, Inc. evaluated six sites within San Mateo County (Table 3.3-2). The following is a brief discussion of the sites investigated. The discussion is limited to available information and does not contain information gathered from detailed on-site investigations.

Table 3.3-2. Potential Landfill Sites - San Mateo County

Corinda Los Trancos Canyon (Forefill)¹
Upper Frenchman's Creek Canyon¹
Locks Creek Canyon¹
Nuff Canyon^{1,2}
Arroyo Leon Canyon^{1,2}
Woodruff Canyon^{1,2}

¹ Site evaluated in 1987 alternatives analysis prepared by BFI

² Site evaluated by 1987 County Department of Public Works study

Corinda Los Trancos Canyon

Corinda Los Trancos Canyon is currently the site of the primary solid waste disposal facility for San Mateo County - at the Ox Mountain Sanitary Landfill. The existing landfill is located in the northern portion of this canyon, approximately 1.3 miles from Highway 92. Further development of landfill facilities in this canyon may be possible by extending the toe (or face) of the existing facility from its current location. An expansion of this nature could provide 17 million cubic yards of solid waste capacity.

Geologically, the potential expansion area is underlain by a thick sequence of alluvial materials and weathered bedrock. Containment of leachate and management of surface and ground waters at the site would be

possible, however, alluvial sediments and weathered bedrock would need to be removed to allow locating the landfill on solid bedrock material.

The canyon contains wetland, riparian, grassland and scrub habitat types. Approximately 3,400 feet of Corinda Los Trancos Creek would be culverted, and an estimated 0.89 acres of wetland and 96 acres of upland habitat would be destroyed.

Access to the site would be via the existing Ox Mountain entrance road. Land uses displaced would include a caretakers residence and tree farm operation. A landfill expansion in Corinda Los Trancos Canyon would be consistent with existing County planning documents.

Nuff Canyon

Development Options

Nuff Canyon, the adjacent canyon to the east of Corinda Los Trancos Canyon, is a potential site for development of a landfill in San Mateo County. Currently the south-central portion of the canyon is the site of an active quarry operated by the Plombo Corporation; however, a landfill in this canyon could potentially be compatible with the existing quarry activities. Possible scenarios for landfill development in Nuff Canyon could be: 1) use of the entire canyon as a sanitary landfill, precluding use of the canyon for quarry activities, 2) a combined quarry/landfill operation in which areas excavated by quarrying activities could be used for placement of solid waste fill, and 3) use of only the northern portion of the canyon, avoiding the area currently being quarried.

The quarry operation has been identified as a significant mineral resource within the quarry's service area. Rock fill mined at this site is used for construction projects in coastside areas near Half Moon Bay and bayside communities in and around San Mateo County. Elimination of the quarry operation for development of a sanitary landfill would require identification of an alternative resource in the current service area and relocation of the exiting operation. The resource conflicts, time necessary to negotiate land acquisition and relocation of the quarry, and permitting requirements for both the quarry and landfill operations would significantly impede development of Nuff Canyon in this manner. This development would provide an estimated 96 million cubic yards of capacity.

Filling the areas within Nuff Canyon already quarried would be an attractive solution in that as the quarry operation progressed northward into the canyon, the landfill could continually expand into the quarried areas. This scenario, however, presents several limiting factors. Operation of a combined quarry/landfill operation in this manner would require quarry activities/equipment and landfill activities/equipment to

operate in close proximity to one another, creating potential for activity interference and accidents. Secondly, quarrying operations would need to be well planned and coordinated with landfill activities to ensure adequate generation of landfill capacity and allow for construction/extension of landfill components (e.g., landfill liner, leachate collection and ground-water collection systems). Currently, the quarry occupies approximately 40 acres of the south-central canyon with plans to progressively move into the northern portions of the canyon. Estimates provided by quarry planners (Mac Carpenter, pers. comm., October 1988) indicate that quarry activities have removed approximately 650,000 cubic yards of rock. The method of rock removal requires excavation of benches along the canyon side slopes. This method would not be compatible with landfill construction. Mineral extraction at the quarry site is currently cyclic, with recent production of approximately 400,000 to 500,000 tons per year. Assuming a continuance of the rate of quarry activity, and an average of 2 tons of rock per cubic yard, the quarry would generate an estimated 200,000 to 250,000 cubic yards of landfill capacity per year. Slightly over 1 million cubic yards of capacity is currently required for disposal of San Mateo County solid waste per year.

The third development possibility for Nuff Canyon would be to develop a landfill in the northern portion of the canyon, outside the quarry boundary. This development plan would allow a more independent operation between the quarry and landfill activities, and would provide an estimated 30 million cubic yards of capacity. Location north of the quarry would allow current quarry activities to continue into the future, but would preclude access to mineral resources that would be covered by the landfill.

Screening of these alternatives indicates that the later development scenario would be the most practical. Use of the entire canyon would displace the current mineral extraction operations and a joint use would not provide adequate capacity development in a configuration suitable for landfill expansion.

Resource Characteristics

Nuff Canyon is underlain by weathered bedrock, with the side slopes and floor of the canyon underlain by a thick sequence of colluvial and alluvial sediments. Containment of leachate and management of surface and ground waters would be possible if overburden (i.e., alluvium and colluvium) was excavated, allowing construction of the landfill on fresh bedrock.

Nuff Creek flows from the northern portion of the canyon, discharging to Pilarcitos Creek. Approximately 4,200 feet of creek would be culverted, and an estimated 1.74 acres of wetland and 115 acres of upland habitat would be destroyed. Nuff Creek does not appear to support a fishery resource.

Access to the site would be from Highway 92 using the existing road for the quarry operation. Mineral extraction in future years would be prevented from expanding into areas used for landfill construction, creating a land use conflict. Landfill development would require amendments to the County's planning documents.

Arroyo Leon Canyon

Arroyo Leon Canyon is located approximately 4.5 miles south of the proposed project. The 179-acre site identified in this canyon could provide an estimated 26 million cubic yards of landfill capacity. This volume, when compared to the relatively large area of the site indicates a low efficiency (value 95 thousand in-place tons/acre) when compared to other alternative sites.

Containment of leachate and control of ground and surface waters in this canyon appear to be possible, however, there is a lack of detailed on-site geologic information. The canyon straddles the Pilarcitos Fault, a fault not considered active by the California Division of Mines and Geology. Bedrock underlying the site consists of sandstone and shale. Design requirements would likely be similar to other alternative canyon sites. The site is drained by Arroyo Leon Creek which eventually discharges to Pilarcitos Creek, approximately 5 miles to the northwest in Half Moon Bay.

Wildlife habitat on the site consists mainly of grassland and brushland types. Scattered Douglas fir and redwood occupy sheltered areas of the canyon, and an estimated 0.5 acres of riparian vegetation consisting of willows and scattered alder trees occupies the area adjacent to Arroyo Leon Creek. The creek has potential for containing a resident trout population, with downstream barriers likely preventing migration by anadromous fish. An estimated 6,000 feet of this intermittent stream would be culverted.

The access to this site would be from Route 35, about 3 miles south of the Route 35/Highway 92 intersection, and would require construction of an intersection on Route 35. Grades along the probable access route are steep (15%). The site would be visible from residential development near the access route to the canyon. The Mid-Peninsula Regional Open Space District owns a portion of the site, and Purissima Creek park is adjacent to the southern portion of the site. Development of a landfill at this site would not be consistent with County planning documents.

Locks Canyon

Locks Canyon is located approximately 1.9 miles west of Apanolio Canyon and 2.5 miles north of Half Moon Bay. This 225-acre site has an estimated capacity approaching 38 million cubic yards. Placement efficiency would be estimated at 109 thousand in-place tons/acre. Approximately 43 acres of the 225-acre site is owned by BFI.

The geologic conditions are similar to those at Apanolio Canyon, consisting of granitic rock overlain by colluvial and alluvial materials. Containment of leachate at the site would be possible, however, because the

canyon is relatively narrow, control of surface runoff (flood flows) may be more difficult.

Locks Canyon contains a small stream tributary to Upper Frenchman's Creek. The canyon contains dense stands of coastal chaparral brush and scattered Douglas fir and an estimated 0.6 acres of wetland habitat. Development of the site would eliminate up to 1,500 feet of stream with potential for resident trout populations. Agricultural dams downstream may prevent access to the upper reaches to this creek by anadromous fish. A total of 6,400 feet of stream would be culverted.

Access to the Locks Canyon site would require truck traffic to travel Highway 1 and streets within the City of Half Moon Bay. Transfer trucks using I-280 and Highway 92 would have increased haul distances. Additional, daily truck traffic volume in Half Moon Bay would increase congestion and potentially create safety problems. Routing of large transfer trucks through residential areas would conflict with intended land uses.

Frenchman's Creek Canyon

This potential alternative site is approximately 1 mile west of Apanolio Canyon and three miles from Half Moon Bay, and is situated between Locks Canyon and Apanolio Canyon. The site comprises 180 acres, of which 47 are owned by BFI, and would have a capacity of about 58 million cubic yards. This capacity, resulting in an efficiency of 205 in-place tons/acre, is the largest of the canyon alternatives investigated.

The canyon geology is similar to that of Apanolio Canyon, consisting of alluvial and colluvial materials overlying weathered granitic rock which overlies dense granitic bedrock. Containment at the site would be similar to Apanolio Canyon, with adequate area available for flood control structures.

Wildlife habitat at the site consists of a riparian corridor along Frenchman's Creek estimated to be 1.3 acres in extent. The canyon is predominantly occupied by dense stands of coastal chaparral with scattered Douglas fir. Construction of a landfill at this site would require culverting of approximately 9,000 feet of Frenchman's Creek, a creek identified by California Department of Fish and Game as supporting a resident trout population.

As with Locks Canyon, Frenchman's Creek Canyon access would require truck traffic to travel Highway 1 and streets within the City of Half Moon Bay. Transfer trucks using I-280 and Highway 92 would have increased haul distances. Additional, daily truck traffic volume in Half Moon Bay would increase congestion and potentially create safety problems. Routing of

large transfer trucks through residential areas would conflict with intended land uses. A landfill also would be visible from the City of Half Moon Bay.

Woodruff Canyon

Woodruff Canyon is located west of Route 35 (Skyline Boulevard) approximately 20 miles south of the intersection of Route 35 with Highway 92. This site has an estimated capacity of 6 million cubic yards. Access to the site would be difficult due to terrain.

Potential Out-of-County Landfill Sites

The San Mateo County Department of Public Works also investigated potential landfill sites outside San Mateo County. The sites identified are presented in Table 3.3-3.

Table 3.3-3 Potential Out-of-County Landfill Sites
(1987 County Department of Public Works)

Newby Island (City of San Jose)
Altamont Canyon (Alameda County)
Kirby Canyon (City of San Jose)
B & J Drop Box (Solano County)

A great deal of negotiation and information requirements are placed upon a jurisdiction applying for a permit to import municipal solid wastes. An example of this is the ongoing attempt by Contra Costa County, which has applied for approval to dispose of wastes at Alameda County's Altamont landfill. The controlling governmental body is the Alameda County Waste Management Authority. The Authority policy, by definition in the County's Solid Waste Management Plan and by practice, is to work cooperatively with other public agencies to solve mutual waste management problems efficiently.

The problem faced by Contra Costa County is that its Central County disposal facility (Acme Fill) will reach capacity and be closed before a new landfill can be sited, permitted and begin receiving wastes. The County is seeking a short-term agreement with Alameda County for disposal of its solid wastes to allow for the time required for establishment of a new landfill. The Altamont facility was identified as the preferable location for disposal of Contra Costa County wastes since Alameda County regulations were similar to other counties regarding importation and Alameda currently has more capacity than other counties considered.

The approval for import of waste into Alameda County requires a two-thirds vote of Authority members, approval by the Board of Supervisors, a majority of the cities representing a majority of the incorporated population, and approval by the California Waste Management Board. The priority of the Authority is to provide landfill capacity for Alameda County jurisdictions and to acquire 50 years of landfill capacity for these jurisdictions prior to allowing importation of solid wastes. The procedure outlined by the Authority for approval of 8 years of importation requires a 22-month process; the major steps and time required are listed below.

- o Preparation of an EIR (8 months)
- o Issuance of a new use permit (4 months)
- o Amendment of the County Solid Waste Management Plan and issuance of a revised Facilities Permit (10 months)
- o In addition, approvals by the RWQCB and BAAQMD would be required

An emergency program is possible to shorten this permitting time for immediate needs (allowing two to four years of interim capacity). This type of project could be exempt under CEQA as an "emergency". A total of 7.5 months would be required to complete the emergency program with the remainder of the requirements listed above completed in a timely manner. The permitting time required begins upon submittal of a completed application for importation of waste to the County. One of the stipulations of approval is that the applying county have an aggressive recycling program equal to Alameda County's. Fees for services to cover processing costs and environmental work must be paid in advance by the project proponent. In addition, current applications must be resolved before additional applications for waste import are considered.

3.4 Site Evaluation (Screening)

Establishment of modern sanitary landfills involves an extensive time consuming process from the initial planning stages to opening of a facility for acceptance of solid waste. This permitting and design period is necessary to conduct site identification studies, site-specific investigations, responsible agency coordination, engineering design, environmental compliance, permitting, and construction. For example, the

currently operating Ox Mountain Sanitary Landfill in Corinda Los Trancos Canyon was identified through a County-wide landfill siting study completed in 1963 and related County planning activities. A 20-year use permit was issued by the County for the site in 1965, and the landfill actually became operational in 1976. The capacity of the site will be reached in 1990, resulting in a landfill that had a life-span of 14 years.

Jurisdictional and private industry efforts to establish a sanitary landfill requires a significant period of time, setting an objective for permitting a large capacity site with a projected life on the order of 20+ years. As land development continues to expand into rural areas of San Mateo County, fewer locations will remain available for landfill development. This combined with the increasing public opposition to landfill siting and increased pressure on the natural environment resulting from community expansion will undoubtedly increase the time required to permit landfills in future years. More numerous, smaller landfills when taken as a whole, require more permitting effort, permitting time, and potentially increase impacts to local land uses, infrastructure and the natural environment.

Several conclusions were made in the 1963 study regarding waste disposal issues. The conclusions of the study which relate to site identification are summarized below.

- No appropriate canyon sites were identifiable on the eastern slopes of the County due to population growth resulting in lack of isolated disposal sites. The only potential sites on the coast or western slopes of the county are canyon sites, however these sites may become unsuitable due to population growth.

The following was among the recommendations stated in the 1963 report:

- Action should be taken to secure the large canyon site (Arroyo Leon Canyon) located west of Skyline Boulevard, as insurance for future filling especially beyond the year 2000 and also against the failure to secure tideland sites.

The 1963 study focused on small solid waste disposal sites scattered among the defined service areas within San Mateo County. At the time this study was undertaken, 16 landfills were operating in San Mateo County. These landfills, included in Table 2.1-1, have since been closed, or their waste acceptance status has been changed. In 1987, the Wilsey, Ham & Blair sites originally identified in the 1963 waste disposal site survey were reevaluated using the updated selection criteria. Factors that were not included in the original array of criteria were development on bayside or coastal wetland areas, development over known Holocene faults, and water quality. Other changes since the 1963 study are commercial and residential development relative to site location and modification of the goals of County waste management planning. The reevaluation of sites identified in the 1963 study is presented in Table 3.4-1.

Among the objectives stated in the 1984 Solid Waste Management Plan, Ox Mountain Ranch/Apanolio Canyon is identified as the preferred location for a county-wide landfill. The county's objective is to design and permit an environmentally sound, large capacity landfill that would service the needs of the entire county for a reasonable period of time. The environmental and economic impacts resulting from development of one site were determined to

Table 3.4-1. Evaluation of Sites Identified in the San Mateo County Waste Disposal Site Survey, 1963¹

Name	Acres	Cap/Mcy ²	Efficiency		Site ⁴ Life	Bayland ⁵	Fault ⁶	Parks ⁷	Urban ⁸	Zoning ⁹	Urban Viewshed ¹⁰
			Mcy/A	MT/A ³							
Tahama Gulch Canyon	6	383	64	41	0	--	x	--	--	PAD	--
Butano	8	383	48	31	0	--	x	--	--	PAD	--
San Gregorio Canyon	6	383	64	41	0	--	x	--	--	PAD	x
Corinda Los Trancos Canyon	60	8000	133	87	1	--	--	--	--	RM	x
Green Valley Canyon	35	2626	75	49	2	--	--	x	--	RM	x
Bernard J Ranch (exp)	35	2626	75	49	2	--	--	--	R	--	x
Milagras Ridge Canyon	35	2626	75	49	4	--	--	x	R	RM	x
Brisbane Bayfront B	65	4300	66	43	4	--	--	--	--	--	x
Junipero Serra	50	5065	101	66	5	--	--	--	R	--	x
Bayshore	80	5065	63	41	5	x	--	--	C	--	x
Burlingame (exp)	85	5500	65	42	6	x	--	--	C	--	x
San Mateo (exp)	105	6800	107	69	6	x	--	--	C	--	x
Medlo Creek	60	6390	107	69	6	--	--	--	C	--	x
Higgins Creek Canyon	65	6390	98	64	6	--	--	--	R	PAD	x
Marsh Road (exp)	210	13600	65	42	13	x	--	--	--	PAD	--
South San Francisco (exp)	180	13545	75	49	13	x	--	x	--	--	x
San Bruno Bay	220	13545	62	40	13	x	--	--	C	--	--
Brisbane (exp)	220	13545	62	40	13	x	--	--	C	--	--
Brisbane (deepen)	450	13545	30	20	13	x	--	--	C	--	x
Brisbane Bayfront A	450	28875	64	42	27	x	--	--	C	--	--
Brisbane (combined A & B and deepen)	450	98745	219	143	92	x	--	--	C	--	x

Arroyo Leon Creek Canyon (see Table 3.4-2)

Notes:

- 1 All computations are as of March 1987.
- 2 Mcy - Thousand cubic yards.
- 3 MT - Thousands of tons.
- 4 Tahama Gulch, Butano and San Gregorio have a site life of less than 1 year.
- 5 Due to environmental concerns landfills cannot be sited on Baylands.
- 6 Under CAC, Title 23, Chapter 3, Subchapter 15, Article 3, Section 2533 (d), a landfill cannot be sited on a known Holocene fault.
- 7 Site is public park.
- 8 Sites are either "R" - residential or "C" - commercial areas.
- 9 Zoning: PAD - Planned Agricultural District
RM - Resource Management.
- 10 Site could be viewed from urban area or state highway.

Source: "Browning-Ferris Industries of California, Inc., San Mateo County District Alternatives Analysis for the Ox Mountain Ranch Apollonio Canyon Landfill Expansion Project," August 10, 1987.

be preferable to similar impacts from development of several smaller capacity sites.

The in-county site alternative selection study conducted by the San Mateo County Department of Public Works is summarized in Table 3.4-2. Analysis of costs associated with disposal of San Mateo County wastes at facilities outside the county are presented in Table 3.4-3 and are summarized in Table 3.4-4.

Table 3.4-4. Summary of Cost

<u>Scavenger Company/ Transfer Station</u>	<u>Possible Out of County Landfill Sites</u>	<u>Estimated Annual Increase in Tipping and Transportation Costs¹</u>
BFI (San Carlos) Daly City South S.F. San Bruno Coastside	Altamont Landfill	\$6,134,000
Same As Above	Newby Island Landfill	\$3,228,000
Same As Above	Kirby Canyon Landfill	\$9,258,000
Norcal	B&J Drop Box	Not Known

¹ The above estimates are based on existing tipping fee data at various landfills as well as assumed additional tipping fees that could be imposed by the agency operating the landfill. The estimates do not include any "buy-in fee" that could be charged. Preliminary discussions have been started with the respective agencies to determine if San Mateo County solid waste would be accepted or what financial and operating conditions would be established.

Source: San Mateo County Department of Public Works, 1987.

Table 3.4-2. Evaluation of Sites Identified by San Mateo County, Department of Public Works Study, 1987.

Canyon Site	Area (acres)	Capacity Thousand Cubic Yards	Site Life (years)	Efficiency ¹	Seismicity	Geology/ Confainment/ Floodling	Water Quality/ Quantity Protection	Water Supply	On-site Cover	Wetland Habitat (acres)
Apanollo	285	123,686	93	265	--	--	No Impact	--	Possible Shortage	3.4
Corinda Los Trancos - Forefill	78	17,250	16	144	--		No Impact	--	Excess	1.5-2.0
Frenchman's Creek	180	56,800	53	205	--	--	No Impact	--	Excess	1.3
Locks	226	37,800	35	109	--	Possible Problems	No Impact	Possible Shortage	Possible Shortage	0.6
Nuff	117	30,180	27	168	--	--	No Impact	--	Excess	1.5-2.0
Arroyo Leon	179	26,200	24	95	--	--	No Impact	--	Excess	0.5

Table 3.4-2 (continued)

	Wildlife ²	Fishery ³	Access ⁴	Uses Displaced ⁵		Aesthetics	Cultural Resources	Availability
				Present	Future			
Apanollo	A	SH/RT	--	OS	--	--	--	BFI owned
Corinda Los Trancos - Forefill	A	RT	--	Ag/OS	--	Impact	--	BFI owned
Frenchman's Creek	A	RT	Hwy. 1, HMB	OS	OS/RMg.	Impact	Not Surveyed	BFI partially owns
Locks	A	RT	Hwy. 1, HMB	OS	OS/RMg.		Not Surveyed	BFI partially owns
Nuff	A	--	--	OS	Min.	--	Not Surveyed	Not available
Arroyo Leon	A	RT	Rt. 35	OS	OS/RMg.	Impact	Not Surveyed	Unknown

Notes:

- 1 Thousands of in-place tons/acre
- 2 A - Affected
- 3 RT - resident trout population or potential
- 4 SH - steelhead trout population or potential
- 5 HMB - Half Moon Bay residential streets
- OS - Open Space
- Ag - Agricultural
- RMg. - Resource Management
- Min. - Significant Mineral Resource
- No Impact

Source: "Browning-Ferris Industries of California, Inc., San Mateo County District Alternatives Analysis for the Ox Mountain Ranch Apanollo Canyon Landfill Expansion Project," August 10, 1987.

Table 3.4-3. Cost Comparison of Existing Landfill Sites Outside of San Mateo County

Scavenger Companies	Out of County Site	Current Tipping Fee	Outside Agency Fee	Mileage ² Cost	Total Estimated Cost	Ox Mountain ⁴ Cost	Cost Difference	Percent Increase	1986 Annual Tonnage	Estimated Annual Increase
BFI (S.C.T.S. 40 MI.R. Trip to Ox Mt.)	Altamont (80 ml) Newby Is. (54 ml) Kirby Cyn. (80 ml)	9.00 8.50 15.60	3.50 2.00 2.00	8.00 5.40 8.00	20.50 15.90 25.60	11.50 11.50 11.50	9.00 4.40 14.10	78.0 38.0 123.0	369,000	\$3,321,000 1,624,000 5,203,000
DALY CITY (44 MI.R. Trip to Ox Mt.)	Altamont (110 ml) Newby Is. (82 ml) Kirby Cyn. (114 ml)	9.00 8.50 15.60	3.50 2.00 2.00	11.00 8.20 11.40	23.50 18.70 29.00	11.90 11.90 11.90	11.60 6.80 17.10	98.0 57.0 144.0	55,000	638,000 374,000 941,000
SOUTH S.F. (42 MI.R. Trip to Ox Mt.)	Altamont (106 ml) Newby Is. (74 ml) Kirby Cyn. (106 ml)	9.00 8.50 15.60	3.50 2.00 2.00	10.60 7.40 10.60	23.10 17.90 28.20	11.70 11.70 11.70	11.40 6.20 16.50	97.0 53.0 141.0	140,000	1,596,000 868,000 2,310,000
SAN BRUNO (40 MI.R. Trip to Ox Mt.)	Altamont (98 ml) Newby Is. (66 ml) Kirby Cyn. (98 ml)	9.00 8.50 15.60	3.50 2.00 2.00	9.80 6.60 9.80	22.30 17.10 27.40	11.50 11.50 11.50	10.80 5.60 15.90	94.0 49.0 138.0	26,000	281,000 146,000 413,000
COASTSIDE (via D.C.T.S. same as D.C. +\$3.00/Ton)	Altamont (110 ml) Newby Is. (82 ml) Kirby Cyn. (114 ml)	9.00 8.50 15.60	6.50 5.00 5.00	11.00 8.20 11.40	26.50 21.70 32.00	9.00 ⁵ 9.00 9.00	17.50 12.70 23.00	194.0 141.0 256.0	17,000	298,000 216,000 391,000

NOTES:

- The outside tipping fee (Col. #2) for the Altamont option is \$3.50/ton (this is the amount that San Francisco is paying at Altamont). Outside tipping fee for other sites, located in San Jose, is \$2.00/ton.
- The mileage fee is calculated by taking round trip distance from transfer to various landfills and multiplying by \$0.10/ton/mile rate (BFI supplied), i.e., BFI to Altamont 80 mi. * \$0.10 = \$8.00.
- The \$3.00/ton surcharge estimate for Coastside is based on the fact that they would most likely be required to go to Daly City and use their facility as was the case when this possibility was explored several years ago.
- The cost for the Ox Mountain landfill is calculated by adding \$7.50 tipping fee to product of mileage from respective transfer station and mileage rate. i.e., \$7.50 + (40 mi. * \$0.10) = \$11.50.
- Coastside goes directly to Ox Mountain. An average of 15 mi. round trip to haul from service area to Ox Mountain.

Source: San Mateo County Department of Public Works, 1987.

Summary of Site Evaluation

Evaluation of the Waste Disposal Site Survey (1963) identified sites (presented in Table 3.4-1) reveals that all of the sites with capacities greater than six years are located on wetlands. Four of the remaining sites, Higgins Creek, Tahama Gulch, Butano, and San Gregorio are located on Holocene faults. Green Valley Canyon and Milagras Ridge Canyon are now within public parks, and Medio Creek, Junipero Serra and Bernardi Ranch are in residential areas. The only location identified in the 1963 study not eliminated by the 1987 screening is Corinda Los Trancos Canyon. However, this canyon is currently the location of the Ox Mountain Sanitary Landfill and has limited remaining capacity, failing to fulfill the County's goal of a long-term facility.

Evaluation of alternative sites identified by the San Mateo County Department of Public Works and BFI studies (summarized in Table 3.4-2) revealed site shortcomings outlined below. In summary, using the 1987 criteria, site evaluation and comparison identifies some of the potential constraints of the alternative sites within the county. These site constraints are presented below.

Nuff Canyon - Nuff Canyon would have a life-span of approximately 27 years. However, Nuff Canyon contains significant mineral resources and is currently the site of an active quarry operation in the central and southern portion of the canyon. Also, the site is not owned by the applicant.

Frenchman's Creek Canyon - This canyon has a capacity which would provide a disposal site for San Mateo County for an estimated 53 years. The site would be accessible only via Highway 1 and City streets of Half Moon Bay. The diversion of landfill truck traffic through residential areas would create public safety risks and conflict with local land uses. A landfill would be visible from Half Moon Bay, and the site is only partially owned by the applicant.

Locks Canyon - This site has a life-span of approximately 35 years. Access to the site would be via Highway 1 and, as with Frenchman's Creek Canyon, would require transfer truck traffic to use Highway 1 and City streets in Half Moon Bay. The site is only partially owned by the applicant.

Arroyo Leon Canyon - This Canyon was identified as a potential future landfill location by the 1963 site study. The site has a smaller capacity than the above alternatives and access to the site would be via Route 35, a state scenic highway. The canyon and adjacent land area is within an Open Space Zone within the County's Resource Management District. A landfill in this canyon would be visible from several residences and Purisima Park.

Corinda Los Trancos Canyon Forefill Project - This site has a projected life-span of 16 years. Prevention of water quality degradation could be difficult due to the geologic characteristics of the canyon. The site would be somewhat visible from Half Moon Bay.

Sites located outside San Mateo County identified for evaluation by the 1987 County study are presented in Table 3.3-3. The feasibility of exporting solid wastes from San Mateo County to a landfill site within a different jurisdiction depends on several factors. A feasible out-of-county landfill needs to be within reasonable distance to San Mateo County to prevent excess transportation costs and must have sufficient capacity to accept the waste material for an extended period of time.

The Altamont Canyon landfill in Alameda County has recently committed 20 years of disposal capacity to the City and County of San Francisco; the result of 6 years of negotiations. This 20-year capacity demand, along with the reserve of 50 years of capacity for Alameda County, complicate negotiations for additional contracts for long-term disposal from other jurisdictions (see Alameda County, Appendix C).

Potential landfills in Santa Clara County include Newby Island and Kirby Canyon. Both sites are located within the jurisdiction of the City of San

Jose. Santa Clara County and the City of San Jose currently have bans on importation of solid waste from outside their jurisdictions. A proposed amendment to the Santa Clara County Solid Waste Management Plan was recently rejected by the City of San Jose. This amendment was intended to provide guidelines for amending the plan to allow the importation of solid waste from communities outside the County. A lifting of the San Jose importation restriction is currently being processed; however, removal of this limitation is not likely in the near future.

If the above actions are completed and approved, San Mateo County could make application to bring its waste to Santa Clara County landfills. The application process for such an action is estimated to require a minimum of 16 months (see Santa Clara County, Appendix C). While neither of the Santa Clara landfills could meet the long-term requirements of San Mateo County, there is potential for these sites to provide interim solutions to San Mateo County waste disposal needs. However, with the current solid waste situation, a solution of this type would be highly problematical.

The evaluation of the potential landfill locations outside San Mateo County, presented in Tables 3.4-3 and 3.4-4, indicates that annual costs of disposal would range from \$3.23 million to \$9.26 million in excess of planned in-County disposal costs. To export solid waste to sites in other jurisdictions, the receiving jurisdiction would need to amend their solid waste management plans and other ordinances restricting importation. These actions would require preparation of environmental documentation under CEQA, and an undetermined period of time for contract negotiation.

Final Site Array

Alternative locations for the disposal of San Mateo County's solid waste are screened from consideration or are constrained for the reasons stated above. The potentially viable landfill sites within San Mateo County are similar with respect to geomorphology and geographic location. The alternative sites are all canyon sites located in close proximity to Apanolio Canyon. Frenchman's Creek and Lock's canyons are the adjacent canyons west of Apanolio Canyon, and Corinda Los Trancos and Nuff canyons are adjacent canyons to the east of Apanolio Canyon. Approximately 5 miles to the south of Apanolio Canyon is Arroyo Leon Canyon. Other characteristics, generally controlled by the aforementioned similarities, also are similar including biological and hydrological resources. Each canyon site contains riparian and wetland habitat, relatively undisturbed upland habitat, and streams with an existing or potential fishery value (with the exception of Nuff Canyon which does not contain a fishery resource).

The land use constraints associated with the various alternatives include displacement of open space areas within the County's Resource Management District for Lock's, Frenchman's Creek, and Arroyo Leon canyons, as well as varying degrees of aesthetic impact for Frenchman's Creek, Corinda Los Trancos, and Arroyo Leon canyons. Nuff Canyon is currently the site of an active quarry; however, a combined landfill/quarry operation could be possible. Access to Lock's and Frenchman's Creek canyons requires a greater haul distance and forces daily landfill truck traffic to use Highway 1 and residential streets within the City of Half Moon Bay.

The objective for identifying alternative landfill locations is to evaluate viable alternatives that potentially reduce the environmental impacts associated with the proposed action while maintaining the purpose and feasibility of the action. Using the limiting factors discussed above the alternatives to the Apanolio Canyon project included in the final array are:

- A reduced fill project in Apanolio Canyon that would fill the northern portion of Apanolio Canyon to an elevation of 850 feet could potentially decrease environmental impacts relative to the preferred project, and would provide an estimated 25-year capacity.
- A Corinda Los Trancos Canyon forefill project, although not as efficient as the Apanolio Canyon preferred alternative (see Table 3.4-2), is considered in the final array because it is within the Ox Mountain Ranch boundary. This property is owned by the applicant and is within an area designated by the County planning documents as being potentially suitable for landfill development. Thus, this alternative would be within the capability of the applicant, and would be compatible with surrounding land use and local planning documents.
- A Nuff Canyon project would provide an estimated 27-year capacity. A cooperative quarry/landfill operation may be feasible. The use permit for the quarry operation identifies a solid waste disposal site as a potential end use for the quarry. Development of Nuff Canyon, now designated as a regionally significant resource area as a County disposal site would conform with long-range County planning objectives, but would impact the life of the quarry. Nuff Canyon is under private ownership, and has not been made available for purchase by BFI.

Therefore, this Draft EIS will evaluate the following alternatives:

Apanolio Canyon 1,200-foot (Preferred Alternative);

Apanolio Canyon - 850-foot;

Corinda Los Trancos Canyon - Forefill;

Nuff Canyon; and

No Action

A detailed description of these alternatives is provided in Section 3.5.

Corps Alternative Definitions

The Corps of Engineers has established four categories (i - iv) by which project alternatives may be defined. These categories are:

- i Within the capability of the applicant and within the jurisdiction of the Corps.
- ii Within the capability of the applicant but outside the jurisdiction of the Corps.
- iii Reasonable, foreseeable but outside capability of applicant but within jurisdiction of Corps.
- iv Reasonable, foreseeable but outside capability of applicant and outside jurisdiction of the Corps.

The project alternatives included in the final array fall into the Corps' definitions as follows:

Apanolio Canyon - 1,200-foot	(i)
Apanolio Canyon - 850-foot	(i)
Corinda Los Trancos Canyon Forefill	(i)
Nuff Canyon	(iii)
No Action	(iv)

Corps Alternatives

An alternative site that would fulfill the Corps' Category ii has not been identified. A location of this classification would need to be; 1) owned or feasibly obtainable by the applicant, and 2) outside the jurisdiction of the Corps. The siting study conducted in the early 1960's identified and evaluated 19 sites within San Mateo County. Six additional potential landfill sites also were evaluated by the San Mateo County Department of Public Works in 1987. Of the potential locations within San Mateo County identified by these studies, sites were eliminated based on

several factors including proximity to holocene faults, baylands, and residential development. This rigorous attempt to identify all potential locations within the County for landfill development has failed to identify a large capacity site that would be outside the jurisdiction of the Corps (i.e., a site not involving placement of fill in U.S. waters or adjacent wetlands).

The Ox Mountain Ranch was obtained by BFI through a series of land purchases after the area was identified by County planning objectives as a long-term disposal area. BFI has not pursued acquisition of other properties for the intent of landfill development, nor has an alternative site within their capability of obtaining been identified or made available for purchase. Interaction with environmental interest groups and agencies also has failed to identify a feasible potential landfill site meeting the definition of Corps Category ii.

3.5 Proposed Action and Alternatives

Introduction

Browning-Ferris Industries of California, Inc. (BFI) proposes expansion of the existing Ox Mountain Sanitary Landfill located in San Mateo County, California. The viable project alternatives, as defined in Section 3.4, include the Apanolio Canyon 1,200-foot project, Apanolio Canyon 850-foot (reduced project), Corinda Los Trancos Canyon Forefill, Nuff Canyon, and No Project (No Action). The proponent's preferred alternative for expansion would fill the northern portion of Apanolio Canyon to a perimeter elevation

of approximately 1,200 feet. Corinda Los Trancos Canyon is the site of the existing Ox Mountain Sanitary Landfill facility.

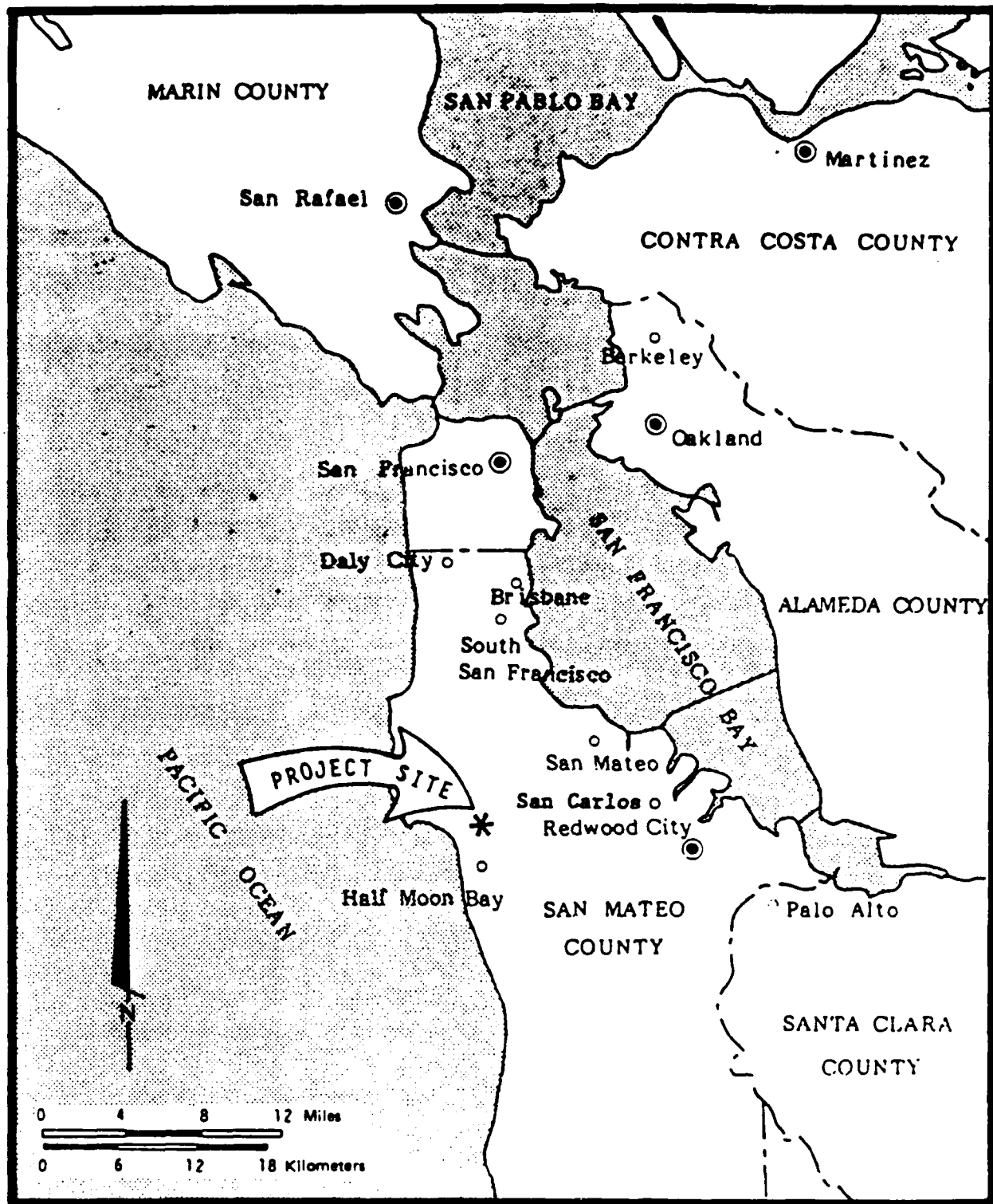
Location

The proposed expansion area is within Digges Canyon (hereafter referred to as Apanolio Canyon), located 3 miles northeast of the City of Half Moon Bay and approximately 20 miles south of San Francisco, in San Mateo County, California, as shown in Figure 3.5-1. The canyon is located on the western slope of the Coastal Range Mountains. *The northern portion of the canyon* is undeveloped and occupied by Apanolio Creek, a perennial stream within the Pilarcitos Creek watershed. The canyon is steep-sided, north-south trending with slopes ranging from 20 to 100 percent. Elevations at the proposed site range from 500 feet at the southern boundary, to elevations of up to 1,500 feet at the canyon ridge.

The site would encompass an area of approximately 285 acres in the northern portion of the canyon. Currently, no permanent access route to the canyon floor exists. The only access is via a road adequate for four-wheel drive vehicles only. Apanolio Canyon is within the 2,786-acre Ox Mountain Ranch property shown in Figure 3.5-2, which is owned by BFI and purchased specifically for use as a solid waste disposal site.

Existing Facility

BFI currently operates the Ox Mountain Sanitary Landfill, shown in Figure 3.5-3, in Corinda Los Trancos Canyon, adjacent to and east of the proposed expansion area. This facility, in operation since 1976, has a design capacity of 7.5 million cubic yards and is estimated to be at capacity in October 1990. Access to the existing operation is via State Highway 92,



Source: Thomas Reid Associates, 1984.



Harding Lawson Associates
Engineers and Geoscientists

Regional Location Map
Ox Mountain Sanitary Landfill
Apanolio Canyon Expansion Site EIS
San Mateo County, California

FIGURE

3.5-1

DRAWN
CSN

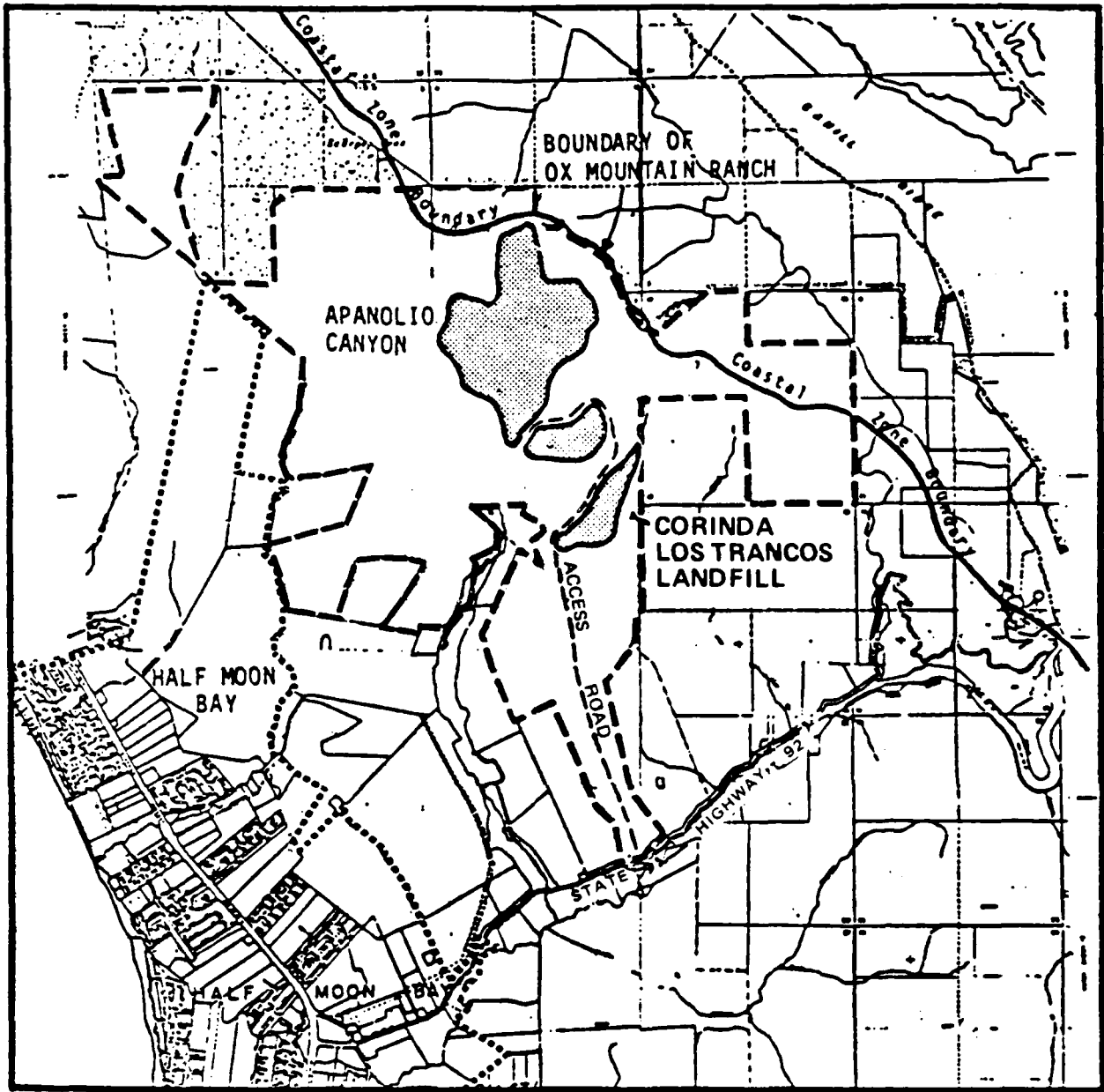
JOB NUMBER
6234,031.01

APPROVED

DATE
9/87

REVISED

DATE



----- Ox Mountain Ranch
Property Boundary

0 0.5 1 1.5 Miles
0 1 2 Kilometers

Source: Thomas Reid Associates, 1986.



Harding Lawson Associates
Engineers and Geoscientists

Ox Mountain Ranch Property Boundary
Ox Mountain Sanitary Landfill
Apanolio Canyon Expansion Site EIS
San Mateo County, California

FIGURE

3.5-2

DRAWN
CSN

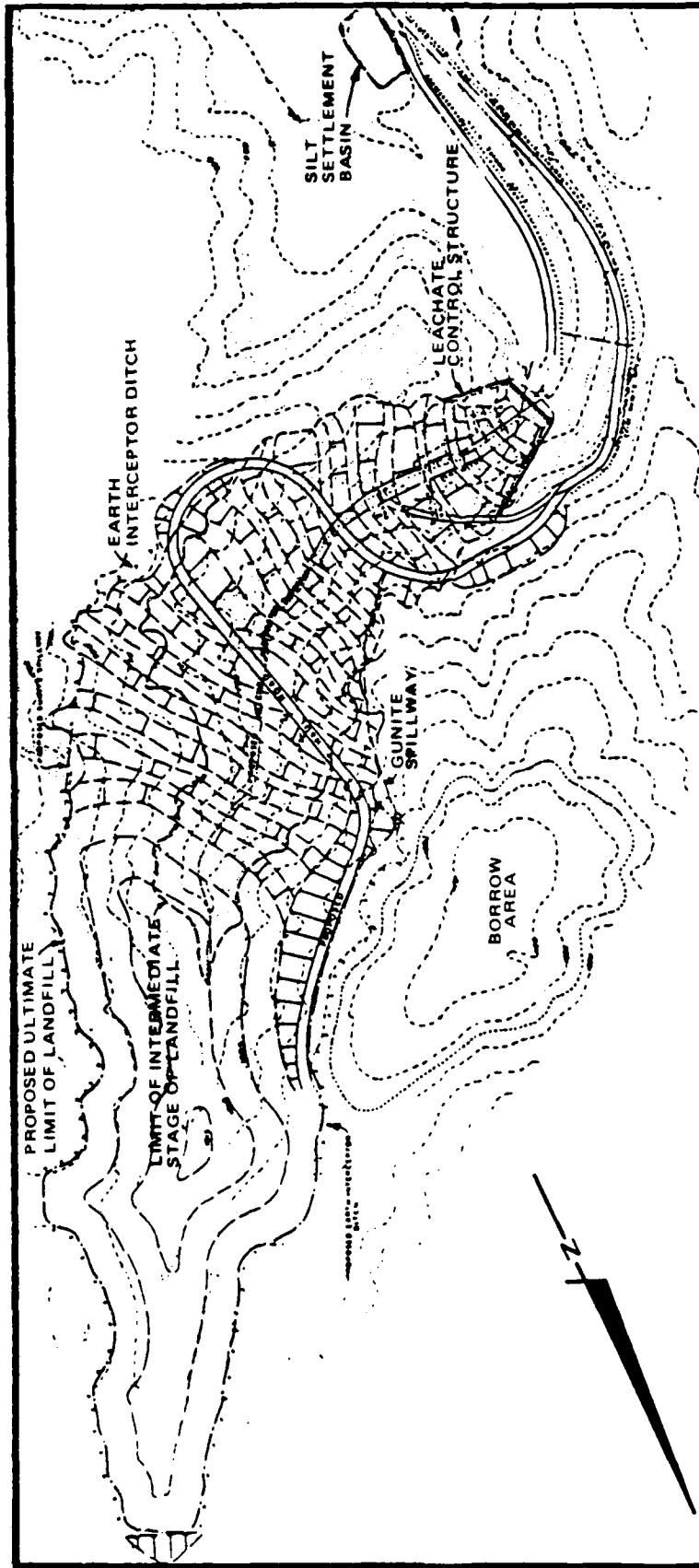
JOB NUMBER
6234,031.01

APPROVED

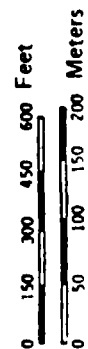
DATE
11/87

REVISED

DATE



Source: Thomas Reid Associates, 1984.



HLA **Harding Lawson Associates**
Engineers and Geoscientists

Plan of Existing Corinda Los Francos Landfill
Ox Mountain Sanitary Landfill
Apanolio Canyon Expansion Site EIS
San Mateo County, California

FIGURE

3.5-3

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
CSN	6234.031.01		9/87		

an east-west route connecting San Mateo and Half Moon Bay. A paved access road connects the base of the landfill to Highway 92. From the base of the landfill (leading edge) a paved/gravel road provides access to the working face of the landfill.

Total average daily refuse acceptance at the site is approximately 2,600 tons (based on 5-day week) and the average annual acceptance is currently 673,000 tons. Solid waste is delivered to the site primarily by 26-ton transfer trucks. The facility currently receives approximately 100 refuse transfer trucks per day. Household refuse brought by private vehicles is dropped in refuse bins at the gate. A separate area of the landfill is also used exclusively by the public.

The Ox Mountain Landfill is a Class III facility, providing disposal for municipal waste, but not hazardous materials.

The facility is open to the public from 8:00 a.m. to 4:30 p.m. Monday through Saturday. Truck traffic departing the landfill to the east on Highway 92 is prohibited from 7:00 a.m. to 8:00 a.m. and eastbound trucks (Highway 92) are prohibited from leaving the landfill between 4:00 p.m. and 6:00 p.m. to reduce the truck traffic along Highway 92 during peak traffic periods.

Landfill Design Rationale

In California, landfill design and water resource protection regulations are established by CAC Title 23, Chapter 3, Subchapter 15 (Discharges of Waste to Land). These regulations must be considered and incorporated into landfill site selection, design rationale, engineering, and contingency

development. The State Water Resources Control Board/Regional Water Quality Control Board (RWQCB) is charged with enforcement of these regulations.

Sites identified for potential landfill development in San Mateo County have been evaluated using a wide range of criteria including physical characteristics (e.g., site capacity and geology), as well as socioeconomic factors (e.g., location relative to population centers, land use, and cost). This process has lead to the evaluation of three sites by this EIS: Apanolio, Corinda Los Trancos, and Nuff Canyons. All of these sites are canyon locations along the western side of the Coastal Range Mountains in San Mateo County. Mean annual precipitation in this area varies with elevation from 20 to 40 inches per year and all of the canyons contain streams with perennial flow. A landfill in any of these canyons must be designed to accommodate the rainfall conditions of the area and associated storm flows, provide for protection of water resources and the beneficial uses of these resources, while remaining operationally feasible.

Canyon filling is generally accomplished using one of two methods, each method requiring a different approach to surface and storm water control. One method of landfill development begins with placement of fill at upper elevations of the canyon with filling in a downward direction toward the toe of the facility. This procedure requires establishment of surface water diversion structures above the fill area followed by establishment of a temporary toe structure downgradient along with subsurface drainage and leachate collection systems, and access roads. Upon completion of fill in the initial area, all structures (i.e., surface diversion, subsurface and

leachate collection systems and access roads) must be extended/relocated down gradient.

The second method of canyon filling places the initial fill at the lower canyon elevations and progresses up canyon. Under this design, the toe of the landfill is permanently established at the lower extent of the fill area. The landfill liner, subsurface water and leachate collection systems are constructed at the base of the facility. As fill is placed in the canyon, surface-water diversion structures, subsurface water, and leachate collection systems are extended as the fill elevation increases.

The goal of the Subchapter 15 regulations and project design engineers is to provide protection of ground-water and surface-water resources from contamination by waste. To ensure this, the landfill must be designed to minimize potential for erosion or flooding from surface runoff events, as well as protect against movement of leachate from the landfill. To adequately design for the physical conditions at each site, construction of the landfill on fresh bedrock and filling the canyon from the lower elevations upward allows maximization of site stability, storm water control, and water resource protection. Establishment of the water management systems in competent bedrock provides protection against washout, seismic damage, overburden pressure, and differential settlement.

The permanent diversion of the maximum anticipated storm flow from the canyon watershed through a buried storm water control facility below the landfill provides assurance that no storm flow event would alter the designed control of water flow. A buried conduit system would not be as

susceptible to damage from flood flows, landslides or mudflows as would a surface diversion design. An underdrain system can be coupled with peak flow reduction ponds in the upper reaches of the canyon to further control storm flows.

The concept of the underdrain design can be modified to conform to varying geologic conditions. The Apanolio Canyon design would employ a single main underdrain (with branching laterals) along the side canyon axis, whereas facilities in Corinda Los Trancos and Nuff Canyons would have a modified design consisting of main drains, placed on both flanks of the canyon. The primary purpose of lateral drains is to allow gravity flow for most of the surface runoff and intercepted ground water to control structures below the toe of the landfill. The central underdrain and leachate collection system would be located below the natural ground surface. Leachate and ground water (not collected by the lateral drains) would require removal by underground lift stations at the toe of the facility in the Nuff Canyon and Corinda Los Trancos Forefill projects. All drainage facilities (storm runoff, stream flow, ground water and leachate) are gravity systems in Apanolio Canyon.

Removal of overburden material at the base of the landfill is generally preferable to preclude settlement and/or movement of soils when surface loading pressures increase. Also, control of ground water and leachate, should the integrity of the liner or collection system fail, may be more effective if the landfill were constructed on fresh bedrock than on more permeable alluvial/colluvial deposits.

a. Apanolio Canyon - 1200-foot Alternative

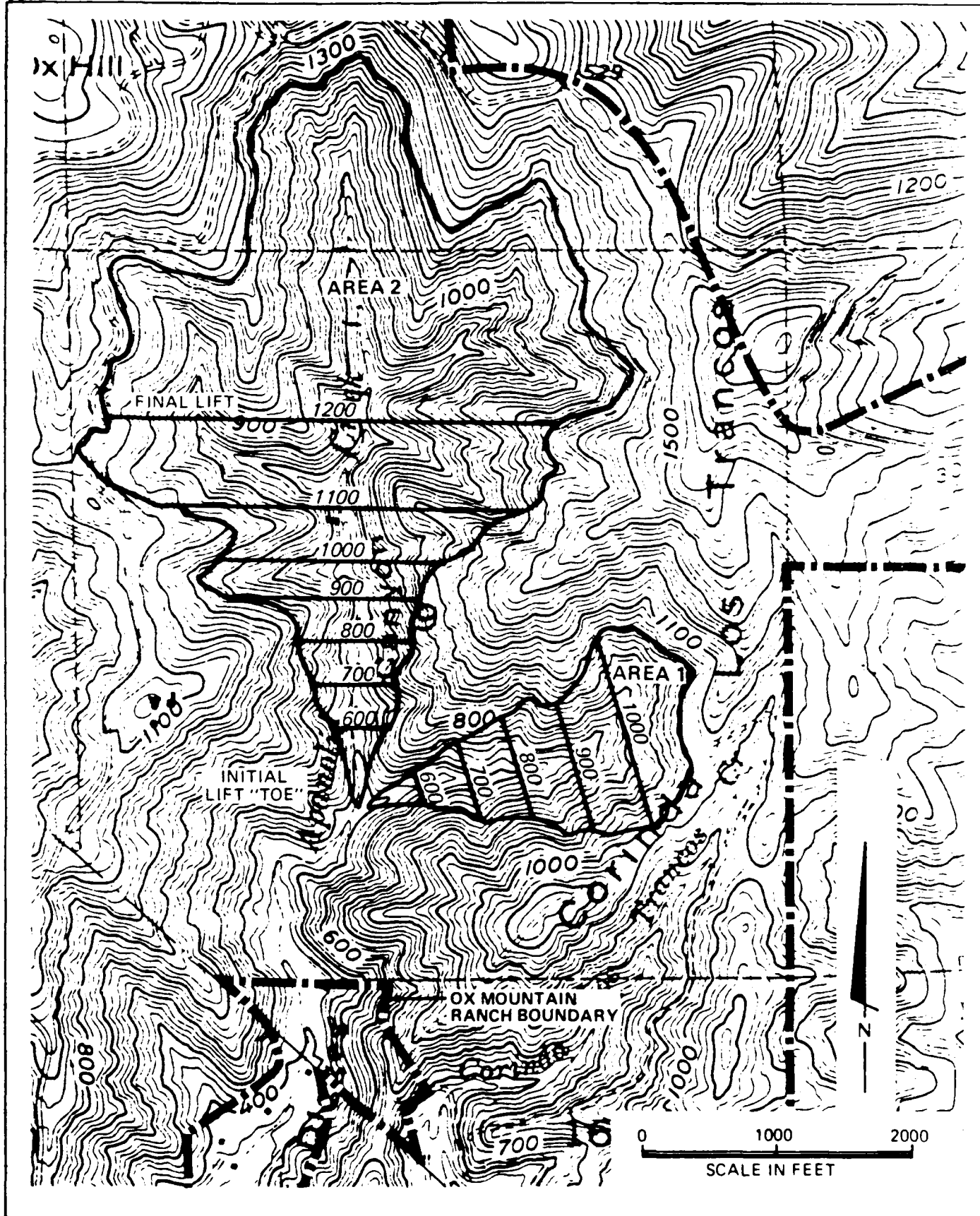
Landfill Design

The proposed expansion would fill the northern portion of Apanolio Canyon from an elevation of approximately 500 feet to a perimeter elevation of 1,200 feet above Mean Sea Level (MSL) as illustrated in Figure 3.5-4. The landfill would fill two areas, the main portion of Apanolio Canyon (Area 2), as well as a smaller unnamed side canyon (Area 1). The 285-acre site is estimated to have a capacity of approximately 131.2 million cubic yards. Of this, an estimated 123.7 million cubic yards would be available for refuse disposal and the remaining capacity would be used by placement of daily and final cover material.

Landfill design would be that of a canyon cut and fill operation. The working face of the landfill would have a 3:1 slope, and 25-foot benches every 50 vertical feet as shown in Figure 3.5-5. Refuse would be applied to the working face of the facility and daily cover would be applied as necessary to prevent odor, litter, and vector problems.

Filling Sequence

The expansion area would be filled from the lowest part of the project area and would progress up canyon through the progression of 2- to 3-foot daily lifts, terminating at the leading edge of the landfill. The working face of the landfill would be kept to a minimum. Upon completion of each lift, the next lift would begin slightly farther back in the canyon and progress toward the leading edge. Assuming a 4:1 refuse-to-cover ratio, the



FIGURE



Harding Lawson Associates
Engineers and Geoscientists

Apanolio Canyon – 1200-foot Alternative
Ox Mountain Sanitary Landfill
Apanolio Canyon Expansion Site EIS
San Mateo County, California

3.5-4

DRAWN
CSN

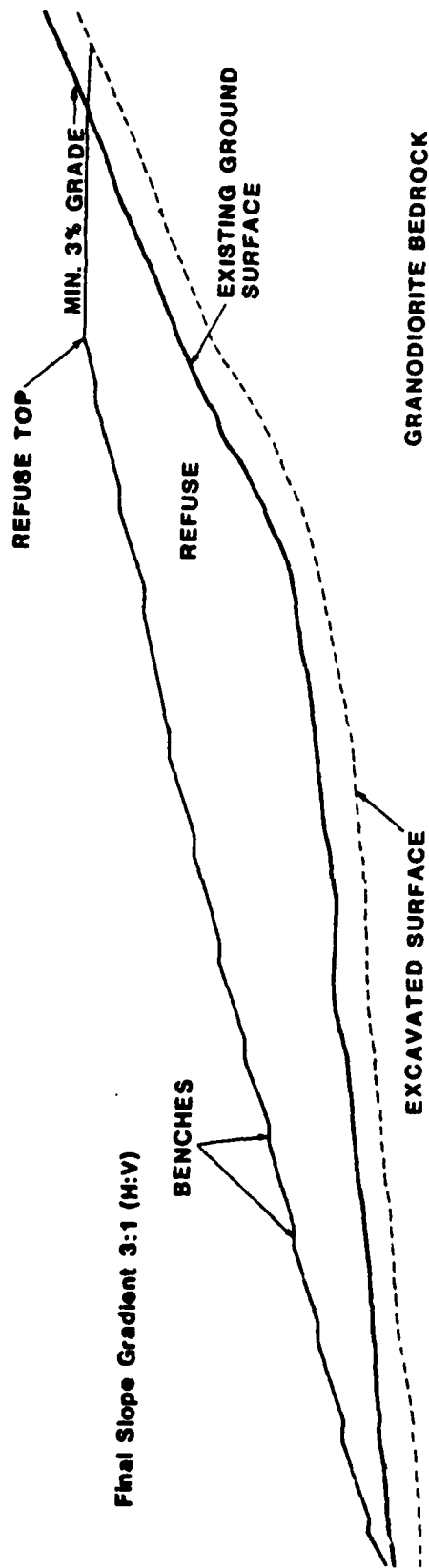
REVISION
6234,031 01

APPROVED

DATE
11/87

REVISION

DATE

**NOTE**

Benches shown are 25 feet wide and located at every 50 foot difference in elevation

Source: Purcell, Rhoades & Associates, 1987.



Harding Lawson Associates
Engineers and Geoscientists

**Typical Landfill Cross Section - Final
Slope/Bench Construction (Area 1)**
Ox Mountain Sanitary Landfill
Apanolio Canyon Expansion Site EIS
San Mateo County, California

FIGURE

3.5-5

DRAWN
CSN

JOB NUMBER
6234,031.01

APPROVED

DATE
9/87

REVISED

DATE

anticipated annual disposal of one million cubic yards of *total fill* would include 200,000 cubic yards of cover material per year.

As development of each lift is initiated, a 25-foot band of vegetation along the canyon walls would be removed. This excavation would provide the majority of the cover material necessary at the site and for site drainage purposes. Excess materials from grading, haul road and site preparation would be stockpiled for later use.

Site Drainage

The toe of the landfill would be located approximately 1,400 feet north of the southerly Ox Mountain Ranch property line. A roller-compacted concrete *dam* and sedimentation basin would be installed in the relatively level area below the toe of the facility. Area 1 would receive drainage from a 118-acre watershed, whereas Area 2 would have a watershed area of approximately 483 acres.

To allow operation of the landfill facility while protecting surface and ground-water resources in the project area, a comprehensive site drainage and water management plan has been developed. This plan incorporates several water management systems. The primary systems are briefly described below and are discussed in further detail in later sections.

- Storm Drainage System - Design of this system provides for management of surface runoff from surrounding hills and the landfill crown and routes the flow beneath the landfill.
- Ground-water Collection System - To prevent ground water from entering the landfill, or potentially damaging the engineered subgrade barrier/clay liner, a ground-water collection and transport system would convey water from beneath the landfill to Apanolio Creek.

- Leachate Collection and Removal System - Leachate generated from the landfill would be collected from the surface of the landfill liner and diverted to a holding tank for proper treatment or disposal. This system would be designed to prevent leachate from contaminating surface or ground-water supplies.

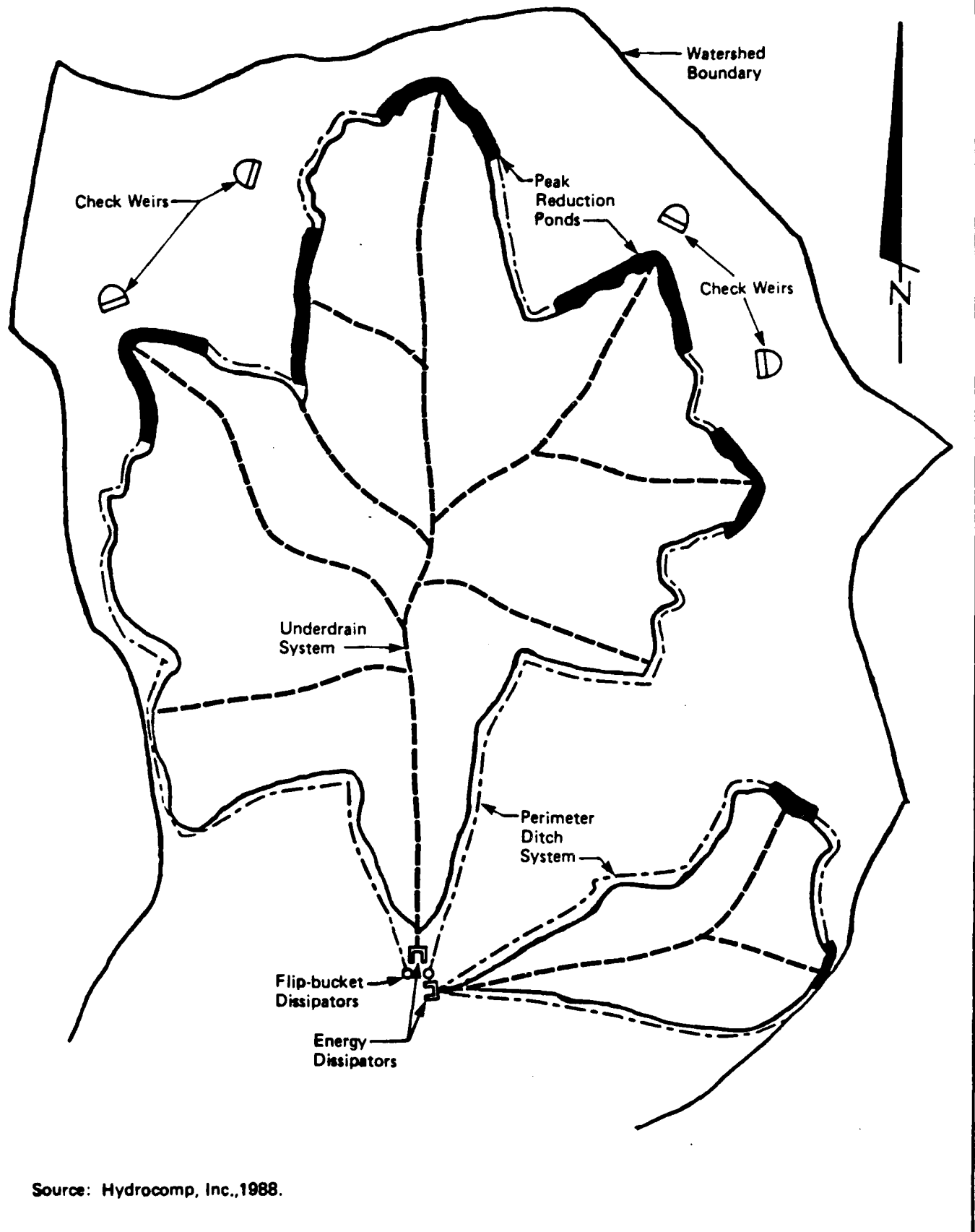
The ultimate 1,200-foot perimeter elevation of the proposed landfill would be reached at the end of the life of the facility. The last refuse to be placed in the landfill would be formed into a low mound atop the fill. This placement would provide final site drainage that would divert water to drainage ditches along the side of the fill, preventing water ponding on the surface of the fill. The maximum elevation of surface drainage structures constructed around the perimeter of the fill would be 1,225 feet.

Storm Drainage System

The storm drainage system designed for the project consists of four components. These components are listed below and the system is illustrated in Figure 3.5-6.

- Underdrain pipe system
- Peak flow reduction ponds and check weirs
- Perimeter ditch drainage system
- Energy dissipators

Underdrain pipe system - This system is designed to collect water from the landfill crown and surrounding areas. The underdrain pipe system would be constructed of circular concrete pipes. Concrete encased corrugated metal pipes *would be used to connect the underdrain to the peak reduction ponds.* Pipes would be sized to flow partially full to avoid pipe pressure that may cause pipe stress or leakage. The size and internal surface roughness would be dictated by the gradient and desired flow velocity.



Source: Hydrocomp, Inc., 1988.



Harding Lawson Associates
Engineers and Geoscientists

Storm Drainage System Components
Ox Mountain Sanitary Landfill
Apanolio Canyon Expansion Site EIS
San Mateo County, California

FIGURE

3.5-6

DRAWN
CSN

JOB NUMBER
6234,031.01

APPROVED

DATE
9/87

REVISED

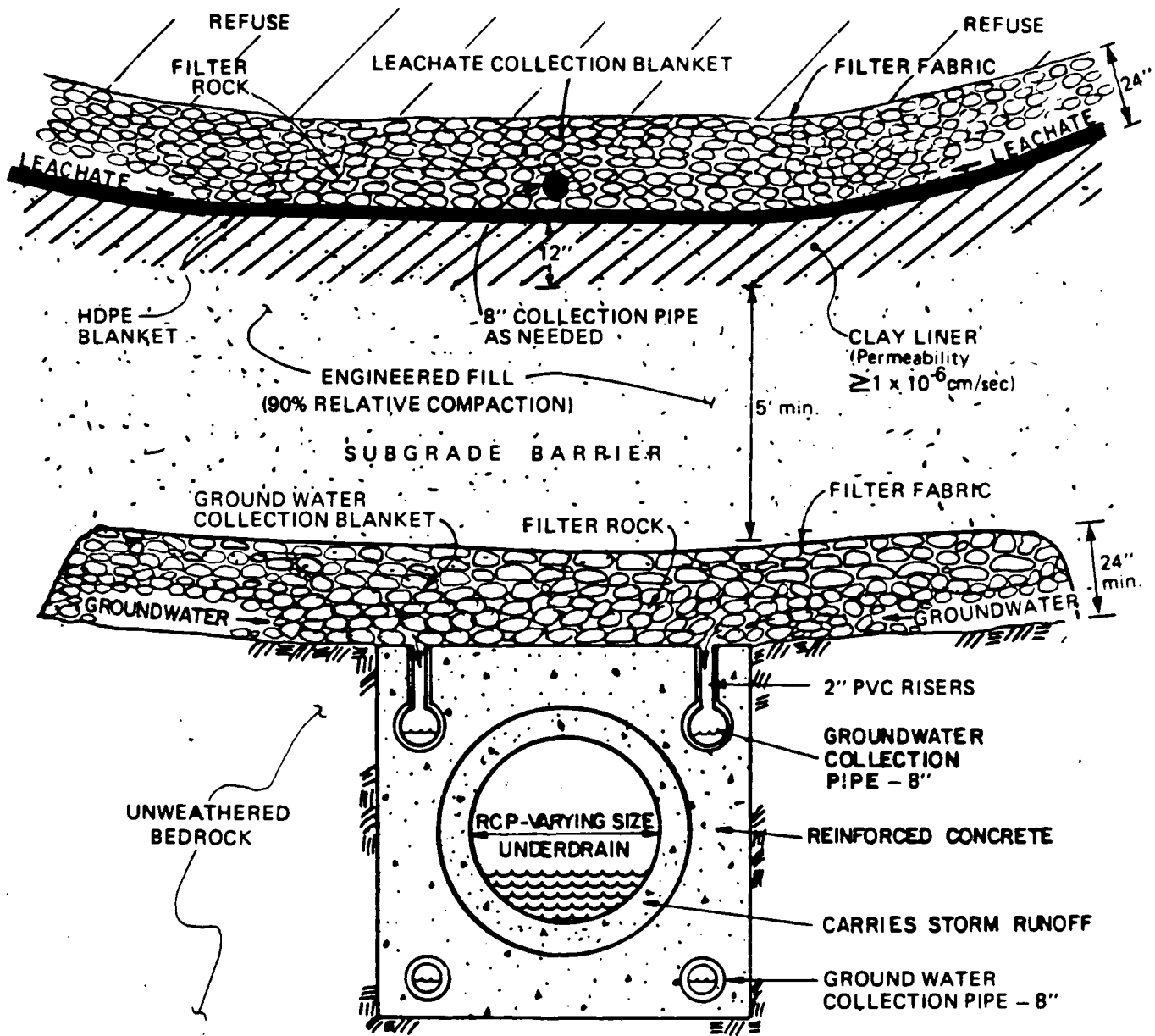
DATE

The underdrain pipes would be encased in reinforced concrete constructed in bedrock trenches, and designed to withstand the pressures from overlying fill material and seismic events. Where construction in bedrock is not practical, a soil-cement mixture would be placed upon fresh bedrock and brought to design grade, to support the underdrain and concrete encasement. A cross section of the underdrain design is presented in Figure 3.5-7.

A 72-inch pipe would be used for the main drain in Area 2, with main and branch drains ranging from 27 to 72 inches. Area 1 would have a 42-inch pipe at the connection to the energy dissipator and branch drains would use pipe sizes ranging from 30 to 42 inches in diameter (Hydrocomp, Inc., 1988).

The configuration of the system, illustrated in Figure 3.5-6, consists of two branches in Area 1 and eight branches in Area 2. The underdrain branches surface at peak flow reduction ponds (described below), with the exception of three branches in Area 2 which are open at the surface to allow air to flow into the underdrain system.

Peak flow reduction ponds - These detention ponds, shown in cross section in Figure 3.5-8, are designed to reduce the flow of water into the underdrain system during high runoff or flood events. The ponds would store water temporarily during peak precipitation events, and discharge water to the underdrain system over time at a flow rate within the design capacity of the drain system. Ponds would be located off the landfill in bedrock to prevent infiltration of water into the fill. To accommodate this location constraint, and due to the steep nature of the topography, the ponds would



Source: Brian Kangas Foulk, 1987.



Harding Lawson Associates
Engineers and Geoscientists

Underdrain System Cross Section
Ox Mountain Sanitary Landfill
Apanolio Canyon Expansion Site EIS
San Mateo County, California

FIGURE

3.5-7

DRAWN
CSN

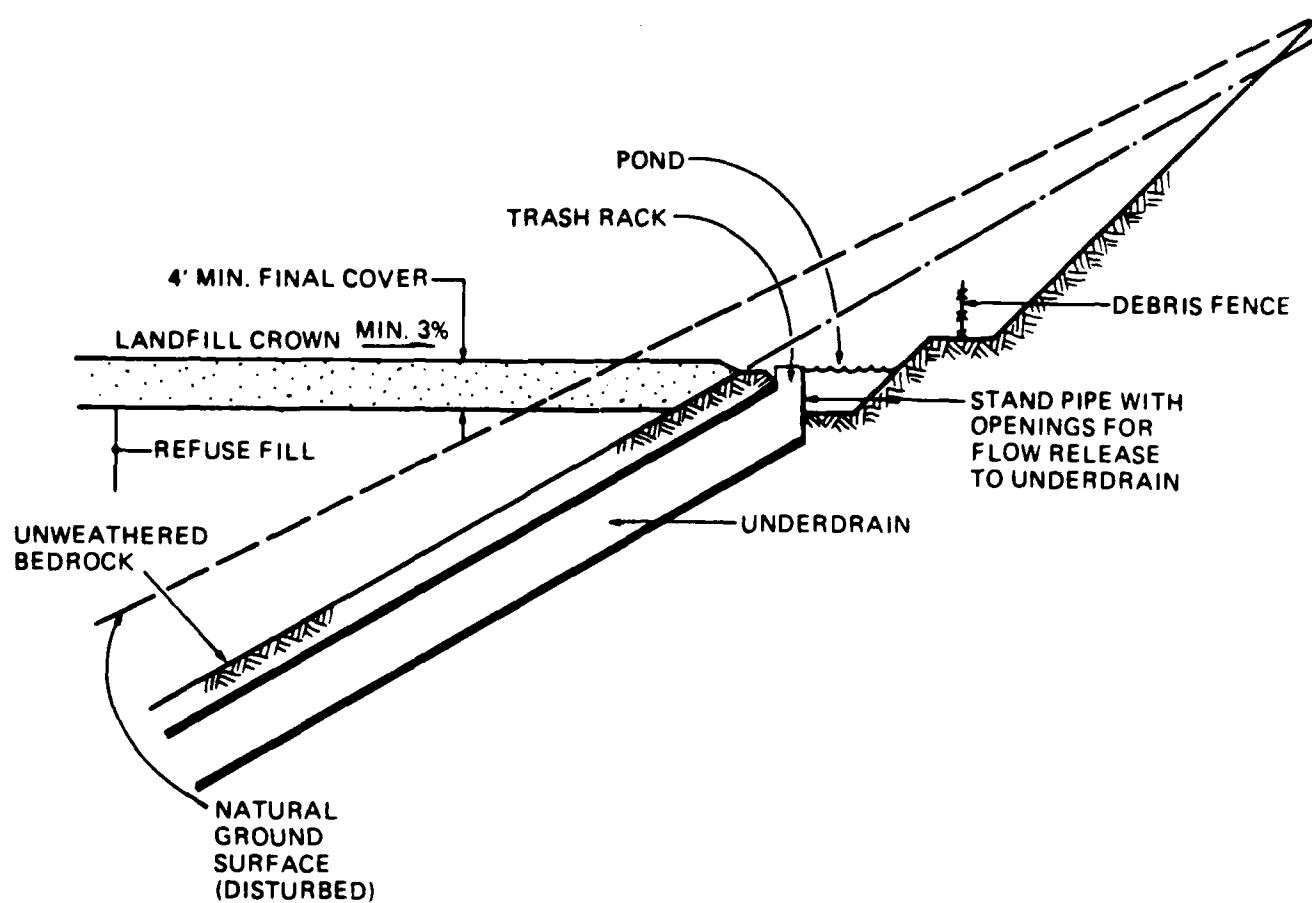
JOB NUMBER
6234,031.01

APPROVED

DATE
9/87

REVISED

DATE



Source: Hydrocomp, Inc., 1988.



Harding Lawson Associates
Engineers and Geoscientists

Peak Flow Reduction Pond Cross Section
Ox Mountain Sanitary Landfill
Apanolio Canyon Expansion Site EIS
San Mateo County, California

FIGURE

3.5-8

DRAWN
CSN

JOB NUMBER
6234,031.01

APPROVED

DATE
9/87

REVISED

DATE

be long and narrow in shape, winding along the rim of the landfill crown. The highest pond on the landfill rim would have a trapezoidal channel shape, with a bottom width of 15 feet, top width of 36 feet, and a depth of 6 feet. At lower elevations, where topography permits, greater bottom and top widths would be used.

The outlet device would be a drop inlet type, as illustrated in Figure 3.5-8. This design would control outflow from the detention ponds at a rate within the capacity of the underdrain system. Storage in the detention pond at the early stages of a storm would be kept to a minimum while flow of stored water would be kept to a constant design rate. Debris racks would be installed around the inlet structure to prevent debris from entering the underdrain system. Perimeter fences would also be installed above the detention pond to collect any debris from upslope areas.

To provide additional protection against peak runoff events, 12- to 15-foot-high check weirs would be built in the drainage channels above the landfill crown. The location of these check weirs is illustrated in Figure 3.5-6.

Perimeter ditch drainage system - The perimeter ditch system, presented in Figure 3.5-6, would collect and convey surface water from the perimeter of the landfill including the landfill crown and benched areas.

The system would consist of concrete-lined channels positioned to drain runoff from the benched areas. These ditches would be at very steep gradients, averaging 0.29 ft/ft, resulting in maximum velocities of approximately 58 ft/sec (Hydrocomp, Inc., 1988).

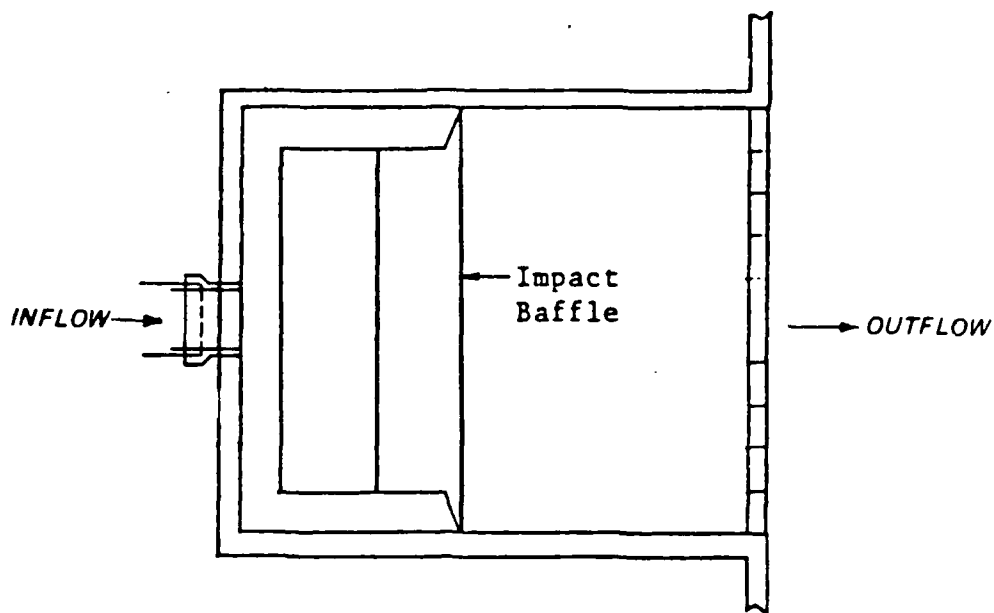
Energy dissipators - These structures would be installed below Area 1 and Area 2 to reduce the velocity of the underdrain flows before they enter the sediment basin. The reduction of flow velocities is necessary to avoid damage to the sediment basin and conveyance channels. Energy dissipators would be impact type stilling basins as illustrated in Figure 3.5-9. Area 1 would have a single energy dissipator for flows from the underdrain and perimeter ditch systems, whereas Area 2 would have an energy dissipator for underdrain flow and "flip bucket" type dissipators for the perimeter ditch flows.

Ground-water Collection

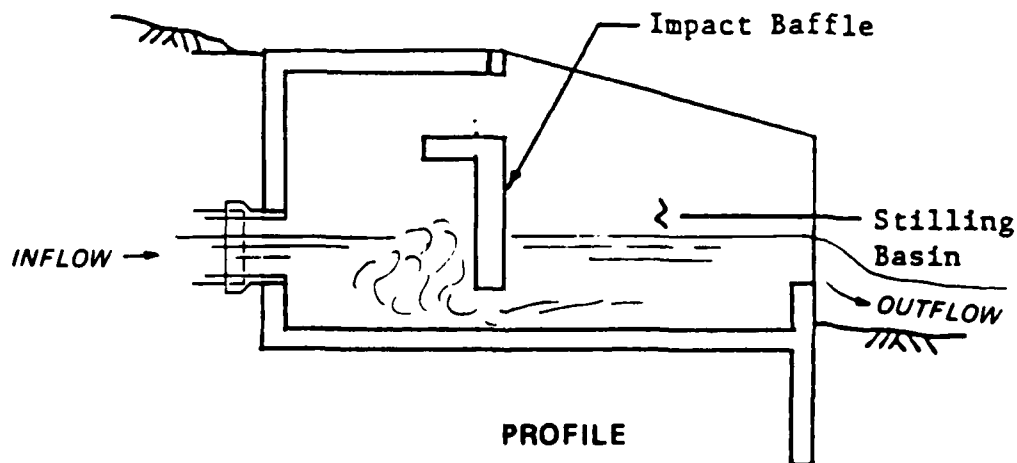
To facilitate removal of ground water from beneath the engineered liner of the landfill, a ground-water collection and transport system would be installed. Ground water migrating along the bedrock/engineered fill (subgrade barrier) interface would be collected and transported via drain pipes to Apanolio Creek below the toe of the landfill.

The collection system would consist of a 24-inch blanket of filter rock surrounded by filter fabric overlying the bedrock beneath the landfill subgrade barrier/clay liner. The collection blanket would be placed directly over the reinforced concrete underdrain encasement. The underside of this channel would open to four 8-inch ground-water collection pipes within the underdrain encasement designed to handle predetermined and isolated lengths of the landfill, as illustrated in Figure 3.5-7.

The filter rock blanket would extend several hundred feet on either side of the main underdrain encasement. Where slopes become too steep to install



PLAN



PROFILE

Source: Brian Kangas Foulk, 1987.



Harding Lawson Associates
Engineers and Geoscientists

Energy Dissipator Design
Ox Mountain Sanitary Landfill
Apanolio Canyon Expansion Site EIS
San Mateo County, California

FIGURE

3.5-9

DRAWN
CSN

JOB NUMBER
6234,031.01

APPROVED

DATE
11/87

REVISED

DATE

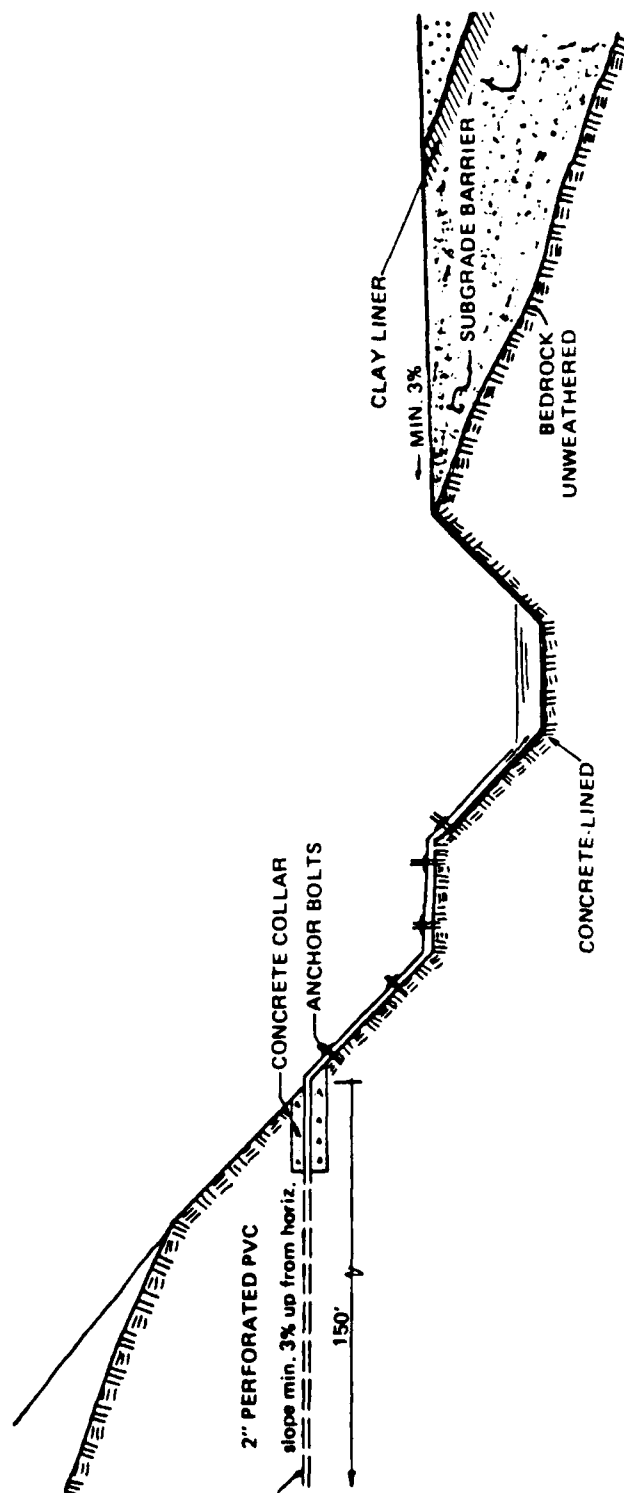
the blanket underdrain, the subgrade barrier/clay liner would be placed directly on the fresh bedrock surface. Hydraugers (horizontal drains) would be installed at springs or seeps encountered during overburden removal prior to landfill liner construction. The flows from the hydraugers would be diverted to the ground-water collection system via gravel filled ditches beneath the liner, or through PVC pipes to the ground-water collection system. Typical hydrauger design is presented in Figure 3.5-10.

Leachate Collection and Treatment

Leachate control and collection would be achieved by installation of a subgrade barrier/clay liner beneath the landfill and a leachate collection system.

The subgrade barrier beneath the landfill would consist of a minimum of 5 feet of engineered fill compacted to at least 90 percent relative compaction overlain by a 1-foot (minimum) layer of compacted bentonite treated material with a permeability of 1×10^{-6} cm/sec or less. This system would be placed over the underdrain system and hillside ground-water collection system, and would be constructed as the landfill progressed up the sides of the canyon.

An HDPE blanket would be placed on top of the impermeable liner for the center width of the leachate collection system (*where the slope is less than or equal to two percent*). A minimum 2-foot layer of filter rock, surrounded by filter fabric, would be installed on top of the HDPE blanket, as shown in Figure 3.5.7. A collection pipe would be installed at the toe of the landfill. The drain rock gravel would handle all expected leachate volumes.



Source: Brian Kangas Foulk, 1987.



Harding Lawson Associates
Engineers and Geoscientists

Typical Hydrager Design
Ox Mountain Sanitary Landfill
Apanolio Canyon Expansion Site EIS
San Mateo County, California

FIGURE

3.5-10

DRAWN
CSN

JOB NUMBER
6234,031.01

APPROVED

DATE
9/87

REVISED

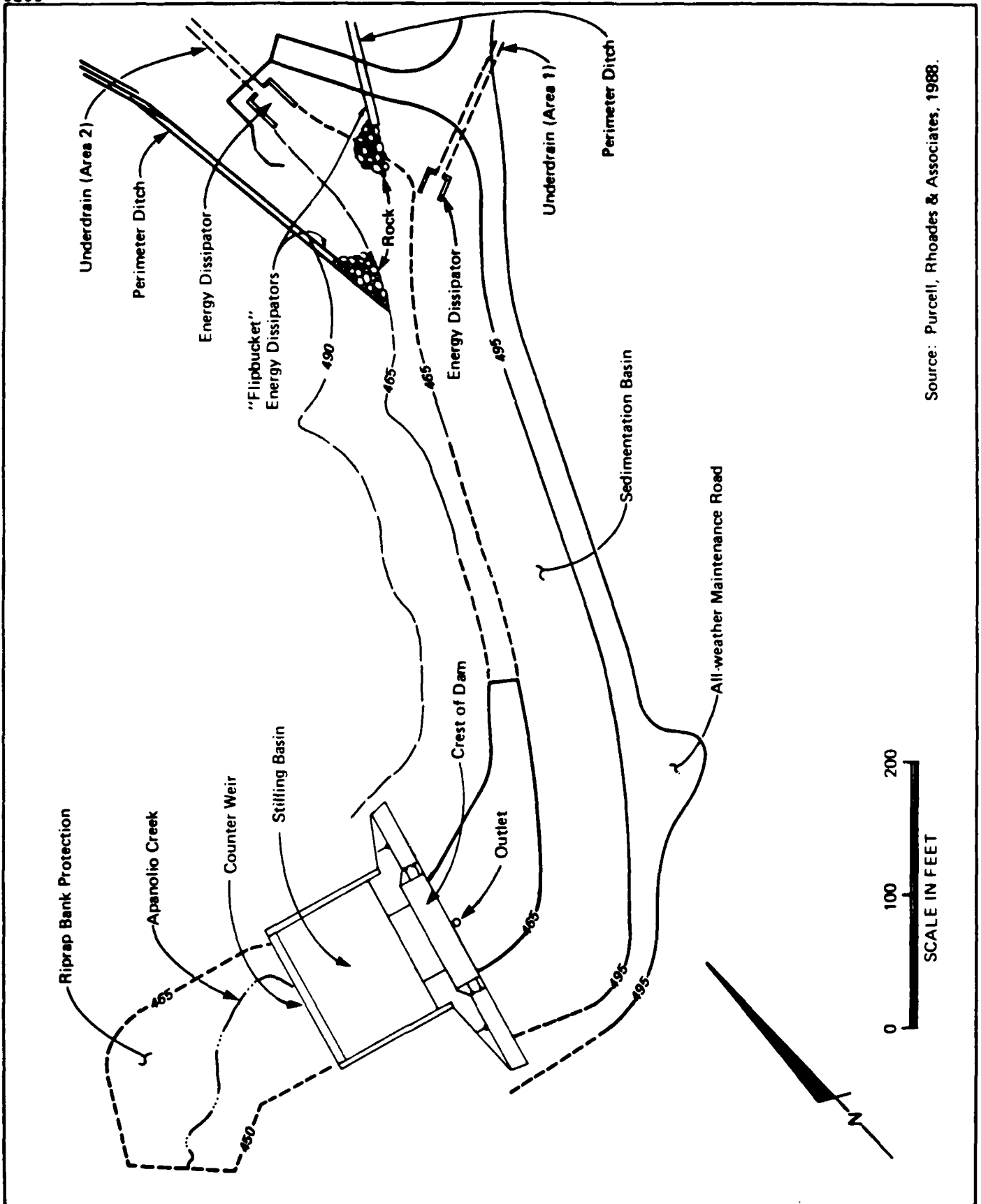
DATE

A leachate removal system would exist at the upstream side of the toe berm. Removal of leachate from this area could be via pump or gravity flow in a PVC pipe through the toe berm at the base of each landfill for Area 1 and Area 2 to a steel holding tank. Leachate levels would be monitored through a vertical riser pipe connected to the leachate toe drain. Leachate collected would be reapplied to the surface of the landfill or, if feasible, would be diverted to aeration/oxidation treatment lagoons.

To prevent migration of leachate beyond the toe of the landfill in the event of a leak in the system, a vertical containment barrier (grout curtain) would be constructed across the canyon. Constructed of chemical grout, this containment wall would have a vertical riser and ground-water monitoring well installed on the upstream side to eliminate buildup of fluid. This grout curtain would extend approximately 40 feet into the underlying fresh bedrock and its design would follow the procedure utilized at the upper reaches of the Corinda Los Trancos Canyon site.

Sediment Basin

To control sediment runoff from the landfill areas, a sediment basin would be installed at the toe of the landfill (*Areas 1 and 2*) as illustrated in Figure 3.5-11. This basin would receive runoff from the underdrain and perimeter drainage systems. A roller-compacted concrete *dam* would be constructed to ensure effective sediment basin performance and controlled fluid discharge. The *dam* is shown in cross section in Figure 3.5-12.



Source: Purcell, Rhoades & Associates, 1988.

200
100
0
SCALE IN FEET

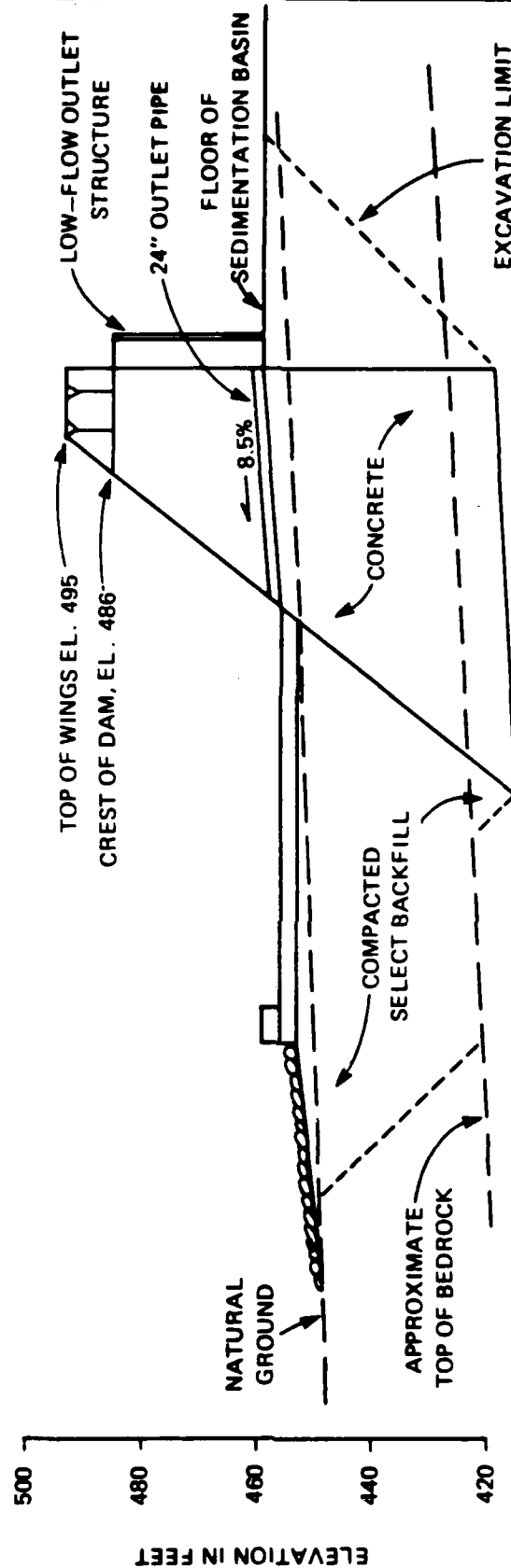
HLA Harding Lawson Associates
Engineers and Geoscientists

Sediment Basin Design
Ox Mountain Sanitary Landfill
Apanolio Canyon Expansion Site EIS
San Mateo County, California

FIGURE

3.5-11

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
CSN	6234,031.01		11/87		



Source: Purcell, Rhoades and Associates, 1988.



Harding Lawson Associates
Engineers and Geoscientists

Roller Compacted Concrete Dam Cross Section
Ox Mountain Sanitary Landfill
Apanolio Canyon Expansion Site EIS
San Mateo County, California

FIGURE

3.5-12

DRAWN
RHC

JOB NUMBER
6234,031.01

APPROVED

DATE
1/88

REVISED

DATE

The sediment basin would be constructed with two outlet devices. The first would be a low flow outlet that would carry the entire flow most of the time. The second outlet device is an overflow spillway that discharges during the larger storms. The mean detention time would be 24 hours when only the low flow outlet is operating.

The concrete dam spillway provides the needed step down in elevation between the basin and the stream channel. The dam's stepped spillway would be followed by a stilling basin to further dissipate energy and prevent erosion. A baffle would be installed at the bottom of the apron to further reduce flow velocities.

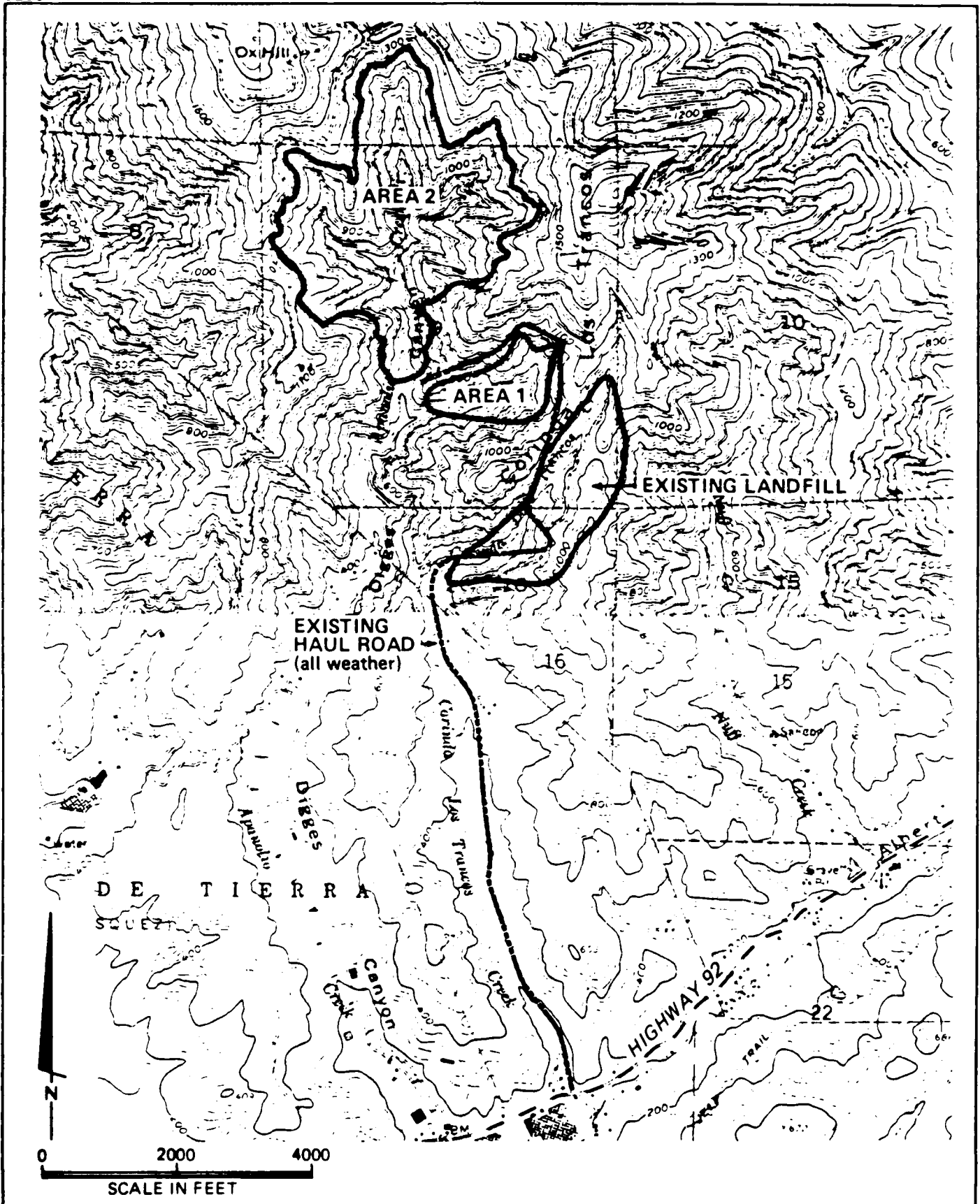
Erosion Control

Methods of erosion control at the landfill site would include use of soil covers (e.g., mulches, vegetation, geotextiles), overland flow velocity controls (e.g., establishment of gentle slopes by grading and terracing slopes), and stream channel controls (e.g., drop structures/check dams and culvert channelization). Maintenance through revegetation and debris removal from drainage paths would reduce potential for on-site erosion.

Site Access

Access to the Apanolio Canyon project would be from State Highway 92 via the existing paved road through the Corinda Los Trancos Canyon facility. No new off-site road construction or connections would be needed.

Construction of a two-lane haul road would be required from the existing Corinda Los Trancos Canyon landfill over a steep ridge to Apanolio Canyon as illustrated in Figure 3.5-13. This haul road would be constructed in two



Harding Lawson Associates
Engineers and Geoscientists

Apanolio Canyon Access
Ox Mountain Sanitary Landfill
Apanolio Canyon Expansion Site EIS
San Mateo County, California

PLATE

3.5-13

DRAWN
CSN

JOB NUMBER
6234,031.01

APPROVED

DATE
4/88

REVISED

DATE

phases. First, a road would be graded over the ridge between the current Ox Mountain Landfill in Corinda Los Trancos Canyon, into Apanolio Canyon.

Later, as Apanolio Canyon became filled, a second road would be built into the upper Canyon from the top of the Corinda Los Trancos Canyon landfill.

Haul roads would be constructed to accommodate truck traffic and would have 30-foot widths and maximum grades of 10 percent. Cut banks may extend 50 to 60 feet upslope due to the steep nature of the site topography.

Construction

Initial construction would begin with the sedimentation basin and *concrete dam* and other facilities to permit landfilling operations in Area 2. This construction would begin prior to final completion of the Corinda Los Trancos Canyon Landfill.

Construction of interim surface drainage/runoff control structures would be required during canyon fill operations. Area 1, having the smaller watershed area, would require construction of peak reduction ponds at an intermediate fill level of approximately 700 feet. The underdrain design for this area would be adequate to accommodate peak flows. Topography of Area 2 would prevent establishment of sufficient peak reduction ponds on the landfill rims in early landfill stages. Therefore, Area 2 would require establishment of check weirs in the watershed above the landfill crown to serve as storm water management/storage structures. Ponds would be created by construction of 12- to 15-foot-*high* gabion *or earthen* weirs with capacities sufficient to store the portion of the 100-year design flow than cannot be carried in the underdrain. As the landfill progresses, the

storage created by check weirs will decrease and the storage in peak reduction ponds will increase.

Costs

Cost of construction of the proposed action would be approximately \$129.4 million. Of this cost, approximately \$5 million would be for permitting and design services and \$124.4 million for construction.

Using the estimated 93-year life-span of the facility, the average annual cost would be \$1.4 million or approximately \$1.05 per cubic yard of compacted refuse. Further discussion of project costs is presented in Section 5.12a.

Operation

Waste Acceptance - The Apanolio Canyon expansion would be classified as a Class III facility and would receive the same type of wastes currently being accepted at the Corinda Los Trancos Canyon landfill. The landfill would receive all scavenger-collected and a portion of the public-delivered wastes in San Mateo County. Currently the Ox Mountain facility receives approximately 2,600 tons of solid waste per day (5-day week) and has an average annual acceptance of 673,000 tons. Assuming a 0.5 percent annual increase in solid waste requiring disposal at the site, the projected life-span of the Apanolio Canyon landfill is approximately 93 years. Waste reduction technology (e.g., recycling) is anticipated to reduce waste stream volume over the life-span of the proposed project.

Site Maintenance - Dust on haul roads and on earth cover would be controlled by spray/tank truck application of water from wells on the property.

Maintenance of drainage structures and sedimentation ponds would be routinely conducted and the area would be patrolled for spilled refuse and windblown paper.

Closure

Upon completion of fill activities, the facility would be closed, final cover would be applied, and the site stabilized by revegetation. The landfill would be closed according to the requirements of Article 8 of Subchapter 15, of Title 23, Chapter 3 of the California Administrative Code.

The final cover, with a minimum thickness of 4 feet, would be compacted to form an impermeable layer to prevent surface waters from reaching the buried refuse cells. When combined with the compacted layer under and along the sides of the landfill, the completed landfill would be, in theory, isolated from water infiltration. Water contained in the cells of the landfill and any percolation of surface waters would be drained by the leachate collection system and either treated and reused on the site, or transported to an appropriate disposal site. Ground water under the landfill would be collected by the underdrain system and discharged to Apanolio Creek below the toe of the facility.

The site would be revegetated and a closure maintenance program would continue for a reasonable period of time (to be determined by the RWQCB) after closure. This program would provide for maintenance of site drainage characteristics, vegetation, and other physical aspects potentially affecting the long-term stability of the site.

Contingency Plan

Title 23, Subchapter 15 (Discharges of Waste to Land) requires the operator of any waste disposal facility to prepare a contingency plan (i.e., corrective action program) for protection of beneficial uses of waters of the state. This plan is intended to define a course of action to be taken should the quality of surface and/or ground water near the facility fall below the objectives defined in the WDR for the project, and to achieve compliance with the water quality protection standards specified in these requirements. *A draft of the contingency plan for the Apanolio Canyon Expansion is presented in Appendix D.*

The establishment of a contingency plan is intended to provide a corrective action process to be implemented in the event of failure of the engineered design of the facility with regard to leachate control and water resource (i.e., beneficial uses) protection. The proposed Ox Mountain expansion has been engineered, in accordance with Subchapter 15 requirements, to protect the quality and quantity of ground and surface waters in the project area. Features of the design include a stormwater runoff control system, leachate collection, containment and treatment system, an engineered subgrade barrier/clay liner and a ground-water collection system. These systems are described in 3.5a. The primary components of the leachate control system include a blanket type collection system, and a grout curtain/cutoff wall located below the toe of the landfill. The water resource protection components are designed to withstand the maximum anticipated storm (100-year) and earthquake (maximum

probable - M8.3 on San Andreas) events. Should a failure of any of the components occur, other portions of the system are designed to prevent contamination of water resources beyond the project area. A ground- and surface-water monitoring program would be established as part of this contamination prevention/detection system.

The contingency plan required by Subchapter 15, defines corrective action should a significant failure of any of the engineered systems fail in a manner that allows contaminants (i.e., leachate) to migrate into surface- or ground-water resources down gradient from the project. This plan is required by regulation and in itself does not reflect the adequacy of the engineered design or suggest that a failure in the system is likely.

If the analysis of the monitoring well data indicated that there may be a failure of the landfill containment system, a remedial investigation program would be implemented. This investigation is intended to identify the source of the problem and, if necessary, recommend corrective action measures to remedy the problem. A special Advisory Committee represented by the operator, the RWQCB, and the LEA would review the technical and economic feasibility of corrective actions under consideration.

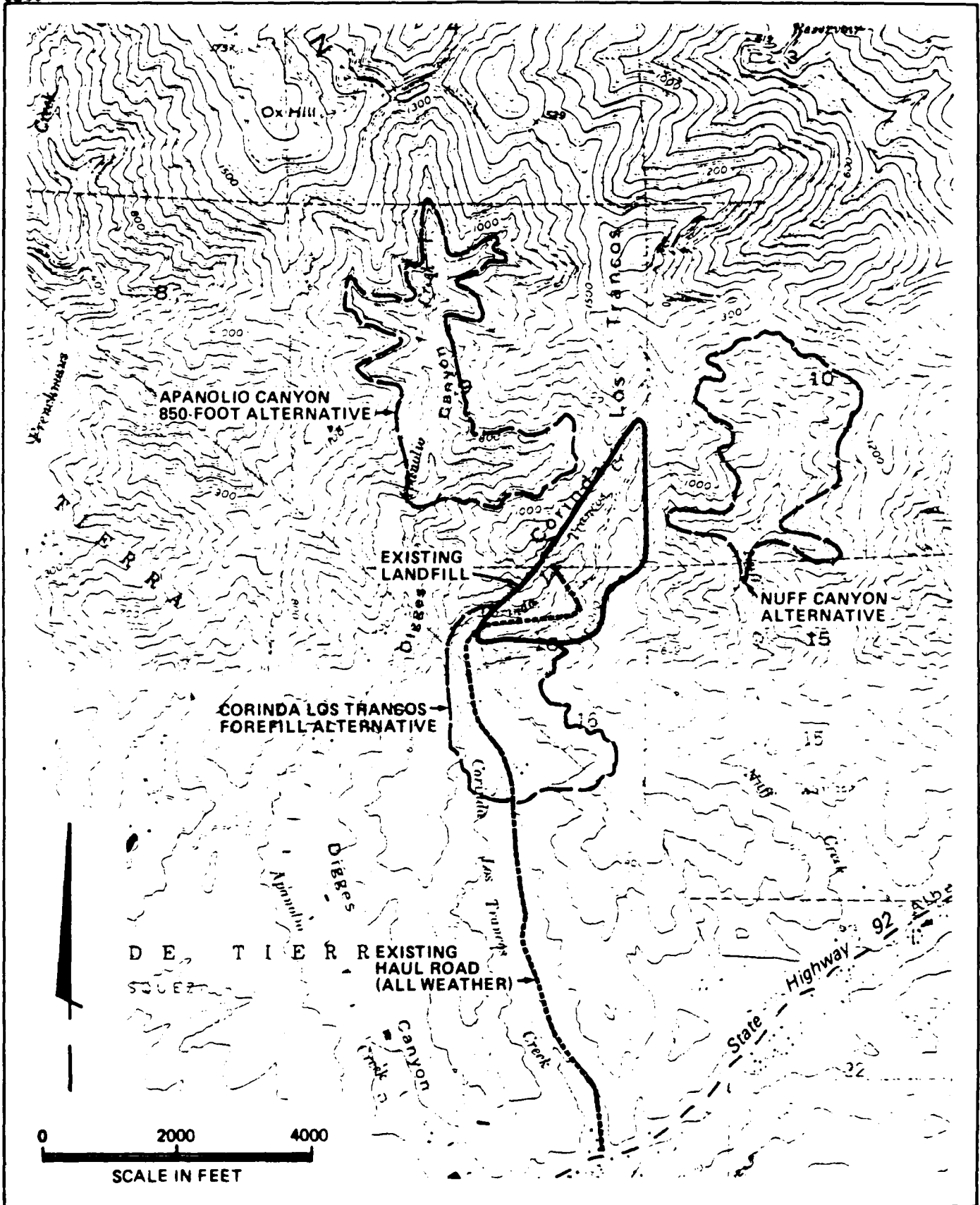
Actions to be taken in any remedial action situation would depend upon the type of failure in the landfill's leachate, surface- , or ground-water control systems. Examples of corrective action could include construction of perimeter drains, construction of a grout cutoff curtain, and replacement of water supplies to domestic users (beneficial uses). The costs associated with these actions would be the responsibility of the operator of the facility (i.e., BFI of California, Inc.).

b. Apanolio Canyon - 850-foot (Reduced Fill Alternative)

This alternative is also located in the northern portion of Apanolio Canyon as illustrated in Figure 3.5-14. The northern portion of Apanolio Canyon would be filled from an elevation of approximately 500 feet to a maximum perimeter elevation of 850 feet above MSL as shown in Figure 3.5-15. The alternative would fill portions of Area 1 and Area 2 as in the preferred alternative, however, final fill elevation would not exceed 850 feet at the landfill perimeter. The landfill would occupy approximately 128 acres.

Landfill design, filling sequence and operation would be the same as the design defined under the preferred alternative. The major difference from the preferred alternative is the capacity of the landfill. Due to the reduced fill elevation, the ultimate capacity of the site would be 27.6 million cubic yards, and the projected life of the site would be approximately 25 years.

Cost of construction for the reduced Apanolio Canyon Alternative is estimated to be approximately \$85.2 million. Of this cost, approximately \$5.0 million would be for permitting and design services and \$80.2 million for construction requirements. Using the projected life of the facility, the average annual cost would be \$3.4 million or \$3.09 per cubic yard of compacted refuse. A more detailed presentation of alternative costs is presented in Section 5.12b.



FIGURE



Harding Lawson Associates
Engineers and Geoscientists

Alternative Landfill Locations
Ox Mountain Sanitary Landfill
Apanolio Canyon Expansion Site EIS
San Mateo County, California

3.5-14

DRAWN
CSN

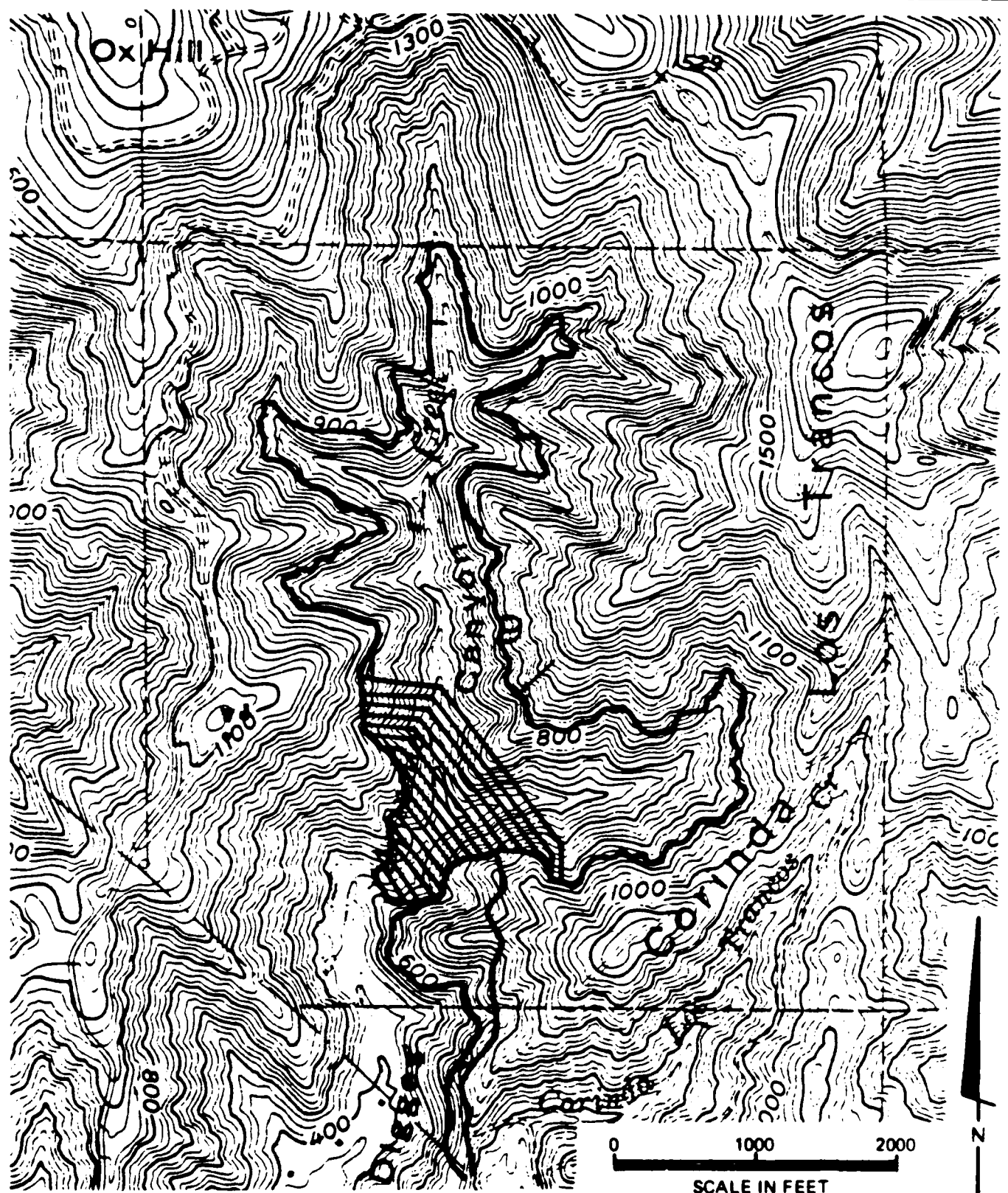
JOB NUMBER
6234,031.01

APPROVED

DATE
11/87

REVISED

DATE



Source: Thomas Reid Associates, 1984.



Harding Lawson Associates
Engineers and Geoscientists

Apanolio Canyon – 850-foot Alternative
Ox Mountain Sanitary Landfill
Apanolio Canyon Expansion Site EIS
San Mateo County, California

FIGURE

3.5-15

DRAWN
CSN

JOB NUMBER
6234,031.01

APPROVED

DATE
11/87

REVISED

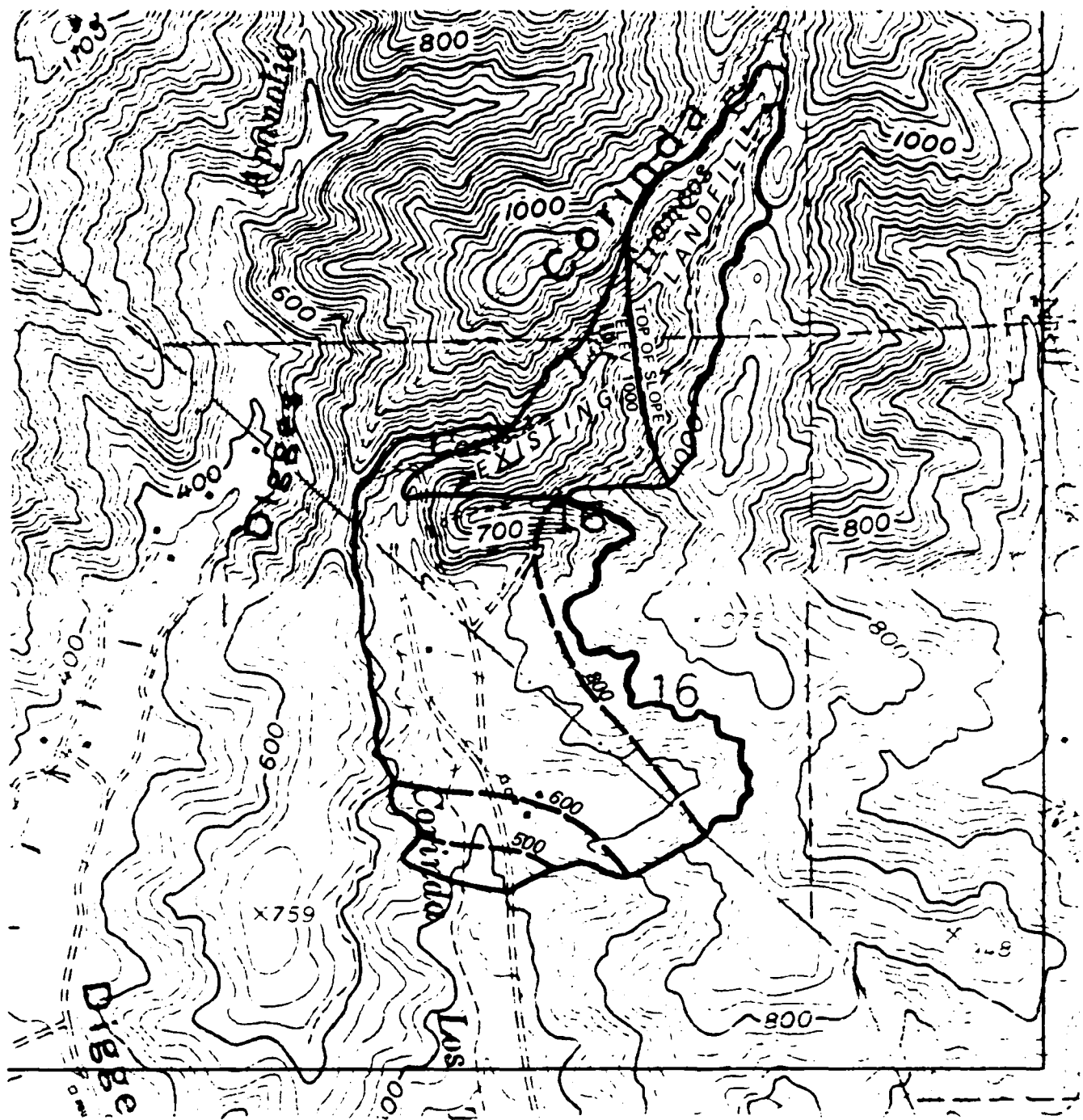
DATE

c. Corinda Los Trancos Canyon - (Forefill Alternative)

The forefill alternative shown in Figure 3.5-14 would extend the currently operating landfill in Corinda Los Trancos Canyon approximately 2,400 feet southward. This alternative would encompass approximately 78 acres and would not require any landfill construction or filling outside of the Corinda Los Trancos Creek drainage basin.

The toe of the landfill would begin at an elevation of about 380 feet above MSL and would attain a maximum elevation of 800 feet at the eastern boundary as illustrated in Figure 3.5-16. Landfill capacity under this alternative would be 17.3 million cubic yards and would have an expected life of 16 years. The construction design would be the same cut/fill design and would employ similar engineering features as the existing Corinda Los Trancos Canyon landfill. Refuse would be placed in 50-foot lifts, beginning at the lowest point in the fill area and progressing upward.

Extension of the existing landfill would require displacement and extension of existing landfill drainage structures. The underdrain and surface runoff interception ditches would be interfaced and extended to allow diversion of water flows to a point below the proposed expansion area. Sedimentation and treatment ponds, runoff control structures, maintenance shops, and leachate collection tanks currently located at the toe of the existing landfill would be relocated downslope to the base of the forefill area. Sizing of conveyance conduits and channels, and sedimentation and treatment ponds would accommodate flow from the existing fill area and the expansion area.



Source: Purcell, Rhoades & Associates, 1987.

0 1000 2000
SCALE IN FEET



Harding Lawson Associates
Engineers and Geoscientists

Corinda Los Trancos Canyon - Forefill Alternative
Ox Mountain Sanitary Landfill
Apanolio Canyon Expansion Site EIS
San Mateo County, California

FIGURE

3.5-16

DRAWN
CSN

JCB NUMBER
6234,031.01

APPROVED

DATE
11/87

REVISED

DATE

Alluvial and unweathered bedrock material beneath the toe area of the proposed landfill site would be removed to allow construction of the landfill subgrade barrier/clay liner, underdrain, ground-water collection, and leachate collection/containment systems upon fresh bedrock. The average depth of excavation of overburden material beneath the landfill site would vary from 140 feet along the canyon floor to 50 feet along the side slopes of the site. The rationale for such a design is presented in Section 3.5 "Landfill Design Rationale" (page 3-15).

A roller-compacted concrete *dam* would be constructed across the canyon below the toe of the landfill. This *dam* would serve as a retention structure for the sedimentation basin. Basic design of the *dam*, energy dissipators, and sediment basin would be similar to the Apanolio Canyon alternative.

A lateral surface/ground-water underdrain would be constructed beneath the landfill along each side of the canyon at approximately the 500-foot elevation. These drains would convey runoff from peak reduction ponds and ground water from above the elevation of the lateral drain via gravity flow to the sedimentation basin and Corinda Los Trancos Creek below the toe of the landfill. The lateral drain on the western side of the forefill area would connect to the lateral drain of the existing Corinda Los Trancos Canyon facility.

Ground-water flow below the lateral drain elevation and leachate flow from the landfill would be diverted to the toe area of the landfill via a landfill underdrain structure and leachate collection system similar to that

proposed for Apanolio Canyon. Ground water and leachate would be collected in the toe berm of the landfill. Underground pumping stations would be used to lift leachate and ground water into holding tanks at the surface. In the event of electrical service disruption, backup diesel-powered generators would provide power for pump operation.

An engineered toe berm wall would be constructed at the toe of the facility to prevent migration of leachate from beneath the landfill. This toe berm structure would be constructed and keyed on fresh bedrock and would span the width of the canyon. A chemical grout cutoff curtain would extend below the toe berm structure a suitable distance into the fresh bedrock to further reduce the potential for movement of leachate off site.

Erosion control methods used would be of similar nature as those proposed under the preferred alternative.

Cost of construction for the forefill alternative is estimated to be approximately \$77.6 million. Of this cost, approximately \$4 million would be for permitting and design services and \$73.6 million for construction. Using the estimated 17-year life-span of the facility, average annual cost would be \$4.9 million or \$4.49 per cubic yard of compacted refuse. A more detailed presentation of alternative costs is presented in Section 5.12c.

d. Nuff Canyon

This alternative would develop a landfill in the northern portion of Nuff Canyon, the adjacent canyon east of Corinda Los Trancos Canyon as shown in Figure 3.5-14. Under this alternative, the landfill would begin at an elevation of approximately 450 feet MSL and would continue up the canyon to

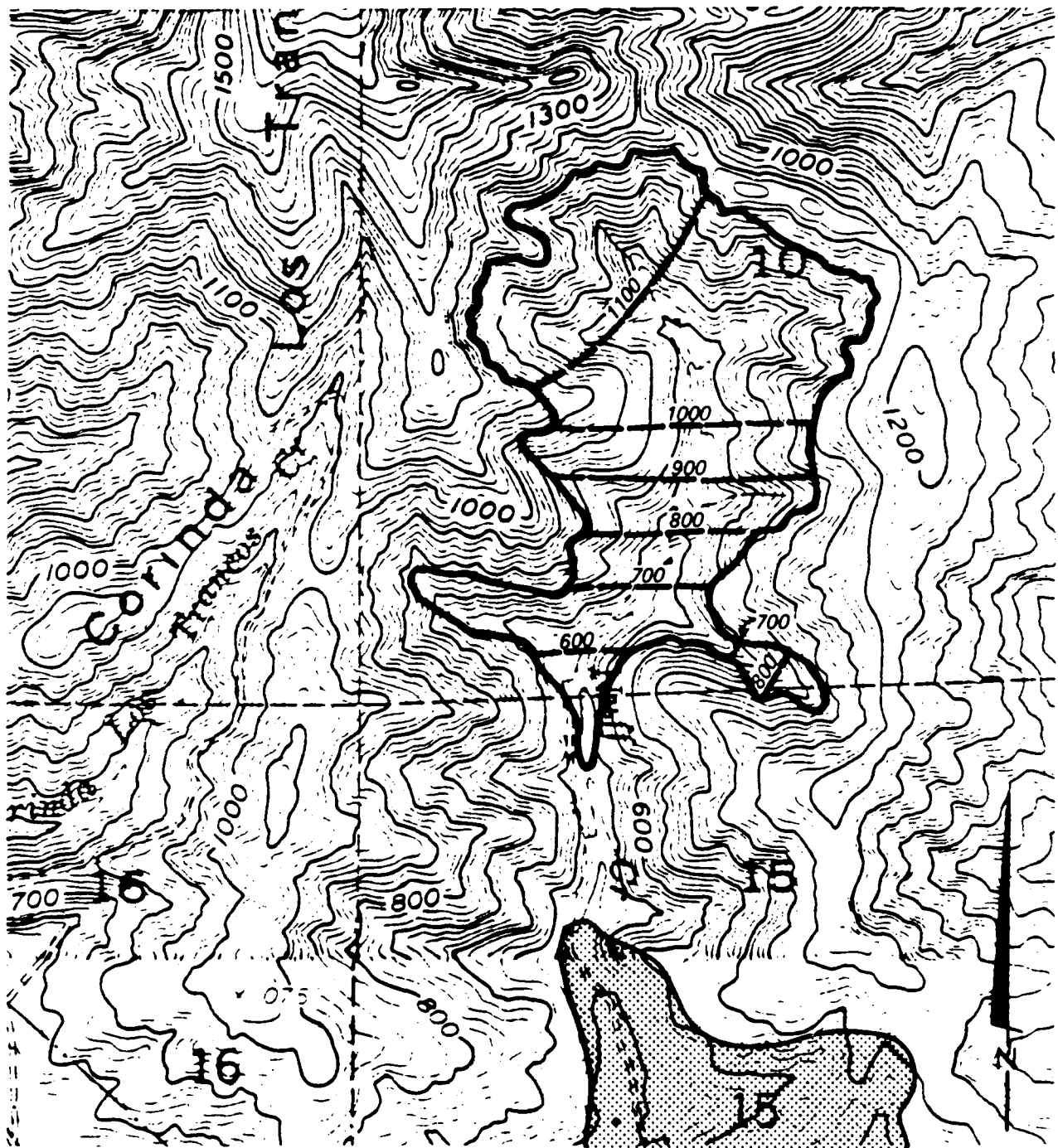
an elevation of approximately 1,100 feet, as illustrated in Figure 3.5-17. The landfill would occupy 117 acres and would be capable of accepting an estimated 30.2 million cubic yards of compacted refuse. The estimated life-span of this alternative would be 27 years.

Landfill design, construction, and operation would be similar to that defined under the Corinda Los Trancos Canyon Forefill alternative, and modified to meet site-specific conditions. Construction of the landfill would require filling and culverting of the upper portion of Nuff Creek.

Alluvial and unweathered bedrock material beneath the toe area of the proposed landfill site would be removed to allow construction of the landfill subgrade barrier/clay liner, underdrain, ground-water collection, and leachate collection/containment systems upon fresh bedrock. The average depth of excavation of overburden material beneath the landfill site would vary from 115 feet along the canyon floor to 50 feet along the side slopes of the site. The rationale for such a design is presented in Section 3.5 "Design Rationale" (page 3-15).

Lateral surface/ground-water underdrains would be constructed beneath the landfill along the sides of the canyon at approximately the 700-foot elevation. These drains would convey runoff from peak reduction ponds and ground water originating above the elevation of the lateral drains via gravity flow to the sedimentation pond and Nuff Creek below the toe of the landfill.

A roller-compacted concrete *dam* would be constructed across the canyon below the toe of the landfill. This *dam* would serve as a retention



Approximate Northern Extent
of Pilarcitos Quarry

0 1000 2000
SCALE IN FEET

Source: Purcell, Rhoades & Associates, 1987.



Harding Lawson Associates
Engineers and Geoscientists

Nuff Canyon Alternative
Ox Mountain Sanitary Landfill
Apanolio Canyon Expansion Site EIS
San Mateo County, California

FIGURE

3.5-17

DRAWN
CSN

JOB NUMBER
6234,031.01

APPROVED

DATE
11/87

REVISED

DATE

structure for the sedimentation basin. Basic design of the *dam*, energy dissipators, and sediment basin would be similar to the Apanolio Canyon alternative.

Ground-water flow below the lateral drains and leachate flow from the landfill would be diverted to the toe of the landfill via an underdrain and leachate collection system similar to that proposed for Apanolio Canyon. Leachate and ground water would be collected from the end of the system in the toe berm. Underground pumping stations would lift the contents to the surface (i.e., ground water to Nuff Creek and leachate to holding and/or treatment facilities). In the event of electrical service disruption, backup diesel-powered generators would provide power for pump operation.

An engineered fill toe berm structure with a clay core barrier would be constructed at the toe of the facility to prevent migration of leachate from beneath the landfill. This structure would be constructed on fresh bedrock and would span the width of the canyon. A chemical grout cutoff curtain would extend below the cutoff wall into the fresh bedrock to further reduce the potential for movement of leachate off site.

Site access would be from Highway 92, via the existing access road to Pilarcitos Quarry. This access road would be extended to the landfill operation to provide adequate truck access. A traffic control and truck registration gate would be constructed down canyon from the quarry operation.

Cost of construction of the Nuff Canyon alternative is estimated to be approximately \$99.8 million. Of this cost, approximately \$4.5 million would be for permitting and design services and \$95.3 million for construction.

Using the estimated 27-year life-span of the facility, average annual cost would be \$3.7 million or \$3.30 per cubic yard of compacted refuse. A more detailed presentation of alternative costs is presented in Section 5.12d.

e. No Action

The "No Action" alternative would result from denial of the Corps permit application for expansion of the Class III sanitary landfill at Ox Mountain Ranch, failure of the applicant to obtain Waste Discharge Requirements from the State Water Resources Control Board, or denial of any other permits or consistency determinations required for the proposed action. This action would require San Mateo County to identify and permit a new landfill site for solid waste generated within the County. The alternatives to San Mateo County would be threefold: 1) export solid wastes to an operating landfill outside San Mateo County; 2) develop a site, currently not identified, within the county; and 3) accelerate development and implementation of resource recovery (alternative technology) to reduce the volume of solid waste requiring landfill disposal. This alternative would also depend upon 1) or 2) above, but would reduce the capacity demand of the receiving facility.

For the purposes of impact analysis, options 1) and 2) are combined into an "Off-site" alternative. Both San Mateo County and BFI have investigated over 20 sites within San Mateo County for potential landfill development. None of the sites identified, excluding the alternative locations evaluated in this EIS, meet the requirements for a county-wide disposal facility. Therefore, since no other alternative sites have been identified, discussion of impacts resulting from this alternative is general in nature.

The "Alternative Technology" alternative would develop alternative means of reducing the volume of solid wastes currently being disposed at County landfills.

Off-site Alternative

Under this alternative no expansion of the Ox Mountain Sanitary Landfill would occur. The currently operating Corinda Los Trancos Canyon facility would reach capacity in 1990, after which solid waste generated in San Mateo County would be diverted to an as yet unidentified site. This site would be either at an existing out-of-county landfill, or at a new in-county site. Permitting requirements would take an undetermined amount of time, and an interim solution (i.e., interim disposal site) would likely be required. Discussion of potential out-of-county locations and the obstacles that could be encountered are discussed in Sections 3.3 and 3.4. The Corinda Los Trancos Canyon landfill would be closed according to the closure plan approved by the RWQCB in ND Order No. 87-047.

Alternative Technology

As stated under the Off-site Alternative, delivery of solid waste to the existing Ox Mountain Sanitary Landfill would cease in 1990. This alternative would involve use of recycling or alternative technology to reduce the volume of waste requiring disposal by landfilling. Implementation of these programs and technologies is in early stages and the total reduction of incoming waste to the landfill cannot be accurately determined. Even with implementation of effective recycling programs, landfills would be required for disposal of residual (non-recyclable) wastes.

Recycling/Resource Recovery

Implementation of resource recycling or waste reduction technology can effectively reduce the volume of materials being landfilled. Materials derived from the residential/commercial portion of the County's solid waste stream that have potential for diversion from the landfill include aluminum, ferrous metals, glass, newsprint, and cardboard. Methods of recycling range from curbside collection and buyback or depository centers (for source separated materials) to larger scale material recovery operations.

Currently, several recycling operations are operating in San Mateo County and several more are in various stages of planning. The existing recycling or recovery centers are operated by commercial sources, manufacturing industries and volunteer projects. A brief description of existing projects, identifying location, material acceptance, and type of facility is presented in Table 3.5-1. In addition to the centers listed in Table 3.5-1, several cities within the County provide unattended centers primarily for collection of aluminum and paper products.

Table 3.5-1. Resource Recycling/Recovery Activities - San Mateo County

<u>Location</u>	<u>Operator</u>	<u>Aluminum</u>	<u>Glass</u>	<u>News- paper</u>	<u>Card- Board</u>	<u>Plastic (bottles)</u>	<u>Metals</u>	<u>Type</u>
Belmont	Golden West Matagrano's	x	x	x	x			B
		x						B
Brisbane	Bayshore Buyback	x	x	x	x	x		B
Burlingame	Mckinley School	x	x	x	x			
Colma	Hillside Landfill	x	x		x		x	D
Daly City	Mussel Rock Reynolds Serramonte			x				D
		x						B
Half Moon Bay	Ox Mountain	x	x	x	x	x		D
Menlo Park	Mid-Peninsula City of Menlo Park	x	x	x	x	x		P
		x	x	x	x	x		S
Pacifica	Ecology Action	x	x	x				D

Pescadero	Pescadero Transfer Station	x	x	x				D
Redwood City	Levin Metal						x	B
San Bruno	San Bruno Transfer Station	x	x	x		x		D
San Carlos	San Carlos Transfer Station	x	x	x	x			D
	YMCA	x		x				D
	YMCA	x		x				D
San Mateo	YMCA	x		x				
	Reynolds	x						B
South San Francisco	YMCA	x		x				D
	BlueLine Transfer Station	x	x		x	x		D
	City of South San Francisco	x	x	x				B

Type: B - Buyback, D - Depository, P - Processing, S - Separated Curbside

SOURCE: Browning Ferris Industries of California, Inc. (Alternatives Analysis).

San Mateo County currently has a Recycling Task Force whose purpose is to study recycling efforts and provide initiative to local municipalities to implement recycling programs. The County's position has not been to mandate recycling efforts, but to provide guidance and encouragement to municipalities. This process has resulted in establishment of curbside recycling programs in several cities including Atherton, Menlo Park, and San Bruno. The status of recycling efforts in various San Mateo County cities is presented in Table 3.5-2. In addition to the County and local municipalities, BFI and other franchise companies have initiated programs to design and implement a county-wide recycling program. Included in this plan is a proposal by BFI to construct a recycler, or processing center, in the County of San Mateo.

Table 3.5-2. Status of Curbside Recycling, San Mateo County

<u>City</u>	<u>In Operation</u>	<u>Start-up Nov-Dec '88</u>	<u>Start-up Jan-Feb '89</u>	<u>Proposal Under Consideration</u>	<u>Preliminary Discussion</u>
Atherton	x				
Belmont			x		
Brisbane				x	
Burlingame			x		
Colma					x
Daly City					x
East Palo Alto*					
Foster City			x		
Half Moon Bay			x		
Hillsborough			x		
Menlo Park	x				
Millbrae				x	
Pacifica		x			
Portola Valley					x
Redwood City			x		
San Bruno	x				
San Carlos			x		
San Mateo			x		
South San Francisco				x	
Woodside					x
<u>Special Districts</u>					
West Bay Sanitary			x		
Montara Sanitary				x	
Granada Sanitary				x	
CSA No. 8			x		

* Not interested

Source: San Mateo County Department of Public Works.

Information obtained from the San Mateo County Department of Public Works, based on the Preliminary Draft of the 1988 Revision to the County's Solid Waste Management Plan, indicates the annual waste stream in San Mateo County is approximately 1.08 million tons per year. Of this waste stream, an estimated 237,750 tons (22.1 percent) is being recycled. This figure includes concrete recycling which accounts for 154,000 tons of the recycled material. The remaining recyclable materials recovered comprise 83,750 tons annually, or 8 percent of the waste stream.

The countywide curbside recycling program, as proposed by BFI, is expected to divert an additional 83,185 tons within one year of startup. A breakdown of this tonnage is presented in Table 3.5-3. The second phase of this plan (end of year two of operation) has a goal to divert 50 percent of the yard waste, wood waste, and mixed paper, for a total diversion of approximately 105,000 tons annually (combined Phase I and II) from the landfill. The total diversion goal for all recycling programs in San Mateo County by the end of the second year of this program is 35 percent (25 percent if concrete is not counted).

Table 3.5-3. Phase I Resource Recovery

Residential Curbside (50 percent participation)	41,665 tpy
Commercial Collection of Corrugated and Glass	7,320 tpy
Buyback or Corrugated, News, Glass, Aluminum	7,500 tpy
Transfer Station/Recyclery - Corr./Bulky	26,700 tpy
TOTAL	83,185 tpy

tpy - tons per year

SOURCE: Browning Ferris Industries of California, Inc.

In comparison, mandatory recycling programs generally have 25 to 30 percent diversion goals. Some Bay Area cities such as Berkeley and San Jose have set recovery goals of 50 percent. Berkeley has recently indicated that it could not meet the goal on the basis of economic and technical feasibility (Meyerson, pers. comm.).

Other Technology

Attaining levels of diversion of solid wastes from landfills in the range of 50 percent would require implementation of an alternative technology in addition to recycling. Combustion, production of refuse derived fuel, composting of the organic fraction of the municipal waste stream, or a combination thereof, are the primary types of alternative technologies currently being studied and developed across the United States.

Waste-to-Energy

Recently, Combustion Engineering proposed development of a waste-to-energy (i.e., incinerator) facility in Redwood City. This project, the Bay Area Resource Recovery Project, would have used municipal solid wastes to generate electrical power. In March, 1988 the California Energy Commission accepted the withdrawal of the Application for Certification for this project. Waste-to-energy projects of this nature do not appear to be economically feasible in the Bay Area at this time for the following reasons (Laakso, pers. comm.).

- o Unavailability of tax-exempt industrial revenue bonds.
- o Withdrawal of PG&E's Standard Offer No. 4.
- o Drop in avoided costs in California due to lower natural gas prices.
- o Inability of a waste-to-energy facility to match the relatively low tipping fees at Bay Area landfills, even when longer hauls and royalties are factored in. (If landfill capacity is severely restricted, the economic feasibility of a waste-to-energy project would be enhanced).

For waste-to-energy facilities ash and non-processable wastes would require landfilling and could reduce landfill need by 75 to 80 percent if the facility were designed to accommodate the entire waste stream. Similarly, economic conditions prevents development of refuse derived fuel projects.

Composting

Composting of municipal waste is a potential alternative disposal process. However, there are no projects operating in the United States that even approach the magnitude of a system that could handle the waste volume generated by San Mateo County. The largest system to date is being planned for Metro Portland at 185,000 tons per year and scaling up of this technology is uncertain. Siting and permitting of a compost or waste-to-energy facility would be difficult in the urban setting of the Bay Area.

4.0 AFFECTED ENVIRONMENT

4.1 Geology, Soils, and Seismicity

a. Regional

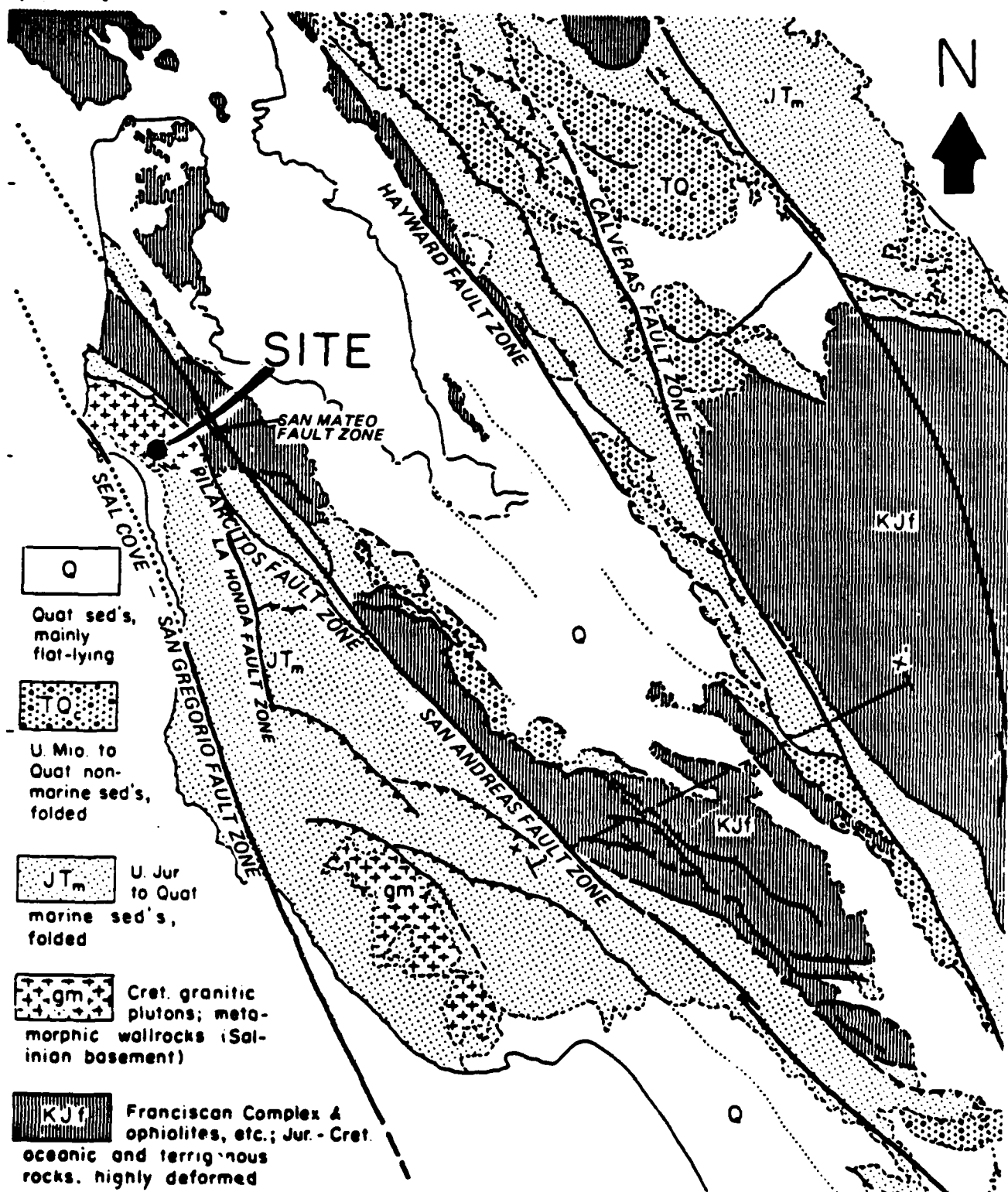
Geology

The project is in the northern end of the Santa Cruz Mountains, within the Coast Ranges Geomorphic Province. The area is characterized by rugged terrain consisting of subparallel mountain ridges and intervening valleys.

Bedrock in the area consists of the Late Cretaceous age (136 to 65 m.y.) Montara Granodiorite, Late Mesozoic age (225 to 65 m.y.) Franciscan Group, and Tertiary age (65 to 1.8 m.y.) sedimentary rocks. The Montara Granodiorite underlies the entire project site and extends several miles northwest of the site (Purcell, Rhoades & Associates, 1986). The Franciscan Group consists largely of graywacke, greenstone, serpentinite, and melange, and is in fault contact with the Montara Granodiorite northeast of the site. The younger (Tertiary age) Lompico Sandstone and Monterey Shale are in depositional contact with the Montara Granodiorite south and west of the project.

Seismicity

The San Francisco Bay Area is characterized as a seismically active area. Most activity is confined to active fault zones, or areas that are generally associated with known geologic structural features (U.S. Army Corps of Engineers, 1978). Faults in the area generally trend in a north-northwest direction as illustrated in Figure 4.1-1. Major active faults in the southern San Francisco Bay Area are the San Andreas, Hayward, and Calaveras faults.



Q

Quat sed's,
mainly
flat-lying

TO

U. Mio. to
Quat non-
marine sed's,
folded

JT_m

U. Jur.
to Quat
marine sed's,
folded

gm

Cret. granitic
plutons; meta-
morphitic wallrocks (Sal-
inian basement)

KJf

Franciscan Complex &
ophiolites, etc.; Jur. - Cret.
oceanic and terrigenous
rocks, highly deformed



SCALE IN MILES

Source: Figure 7, Purcell, Rhodes & Associates, 5/21/86.

FIGURE

4.1-1



Harding Lawson Associates
Engineers and Geoscientists

Regional Geology and Major Faults
Ox Mountain Sanitary Landfill
Apanolio Canyon Expansion Site EIS
San Mateo County, California

DRAWN
CSN

JOB NUMBER
6234,031.01

APPROVED

DATE
10/87

REVISED

DATE

Near the project site, the major active faults (activity in past 10,000 years) are the San Andreas and the Seal Cove-San Gregorio faults. The San Andreas fault zone is located approximately 3 miles east of the project site and extends from the Imperial Valley at the southern end of California to its convergence with the Mendocino fault zone off the coast of Humboldt County in northern California (Jennings, 1975). The Seal Cove-San Gregorio fault zone lies approximately 2 miles west of the site (Purcell, Rhoades & Associates, 1986) and extends from Monterey Bay to its convergence with the San Andreas fault zone near Bolinas, California. It is unknown whether the Seal Cove-San Gregorio fault zone merges with the Palo Colorado fault zone in Monterey Bay (Harding Lawson Associates, 1976).

Potentially active faults (activity in past 2 million years) located near the site include the San Mateo, Pilarcitos, and La Honda faults. Potential for severe ground shaking in the project area as a result of movement along these faults is less than for the active faults mentioned above.

b. Apanolio Canyon

Topography

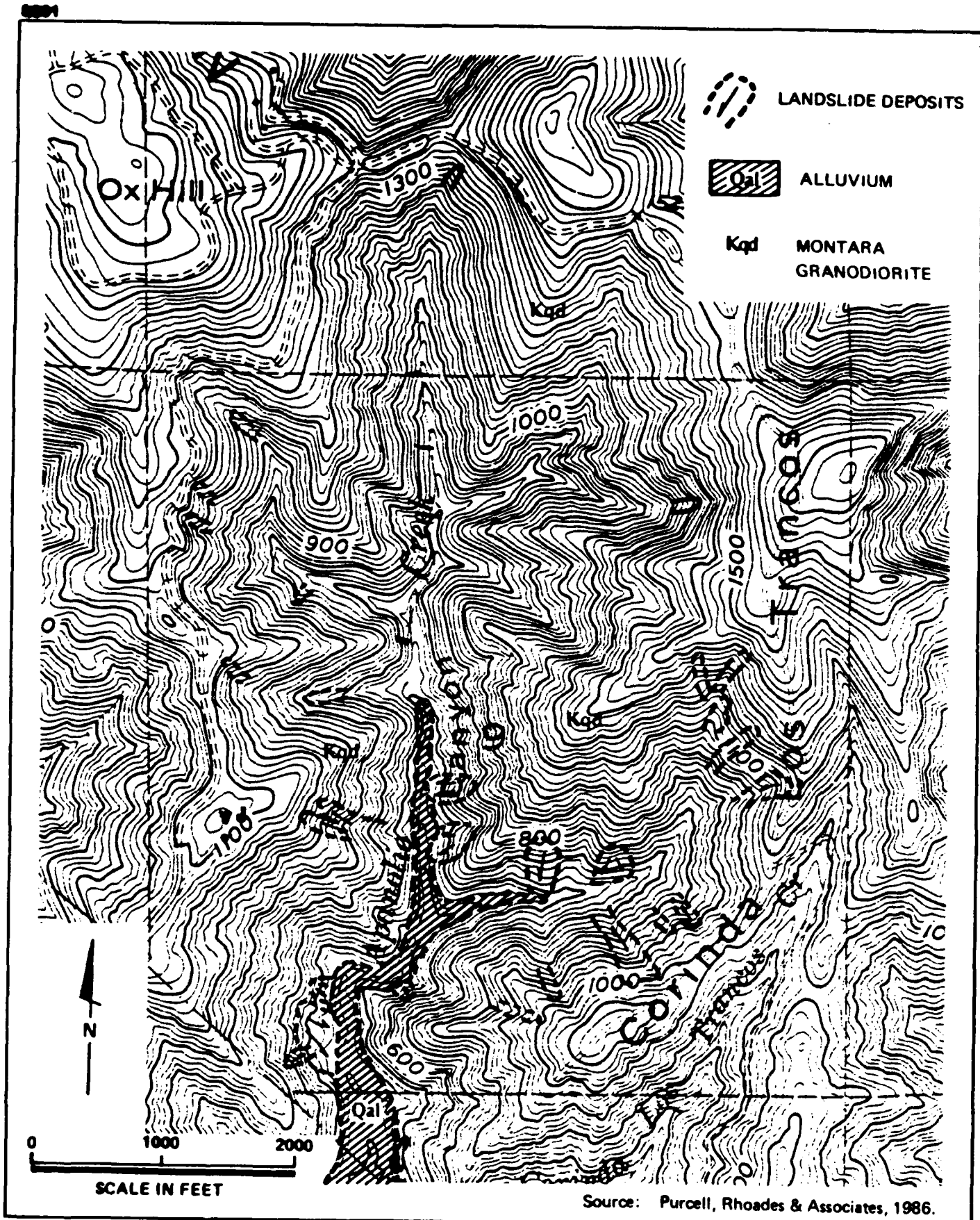
Apanolio Canyon is characterized by steep terrain with natural slopes in the range of 40 percent to 125 percent (Thomas Reid Associates, 1984). The main drainage in Apanolio Canyon trends in a southerly direction. The project site is drained entirely by Apanolio Creek which flows south into Pilarcitos Creek.

Geology

Bedrock in the upper portion of Apanolio Canyon within the proposed site is Montara Granodiorite as shown in Figure 4.1-2. The unit is a batholith (an igneous intrusion) and is exposed over an area of approximately 30 square miles. The rock is typically extensively fractured within the upper weathered zone to depths of up to 100 feet or more along ridge tops. Fracture frequency and spacing decreases with increasing depth.

Weathering of this rock unit is greatest near the ridge tops and becomes less extensive downslope. Exploratory borings indicate weathered bedrock up to 100 feet in thickness near the ridge crests decreasing to approximately 20 feet in thickness beneath portions of Apanolio Creek. The texture of the rock when fresh is commonly medium- to coarse-grained, with fine-grained feldspar crystals as a ground mass. Quartz represents less than 10 percent of the modal composition and green biotite is generally widespread. Numerous aplite and diabase dikes are present. The color of the rock ranges from yellowish-brown when weathered, and gray when fresh (Purcell, Rhoades & Associates, 1986).

Examination of core logs indicate that the bedrock underlying the project area is highly fractured, frequently with several open fractures per foot. Although orientation of fractures is often scattered, a dominant orientation exists that is approximately parallel with the canyon axis. Fractures tend to be more open in the shallow subsurface due to weathering and stress release; however, they appear to tighten rapidly with depth as the degree of weathering decreases and lithostatic pressures increase (Purcell, Rhoades & Associates, 1987a).



Harding Lawson Associates
Engineers and Geoscientists

Site Geology - Apanolio Canyon
Ox Mountain Sanitary Landfill
Apanolio Canyon Expansion Site EIS
San Mateo County, California

FIGURE

4.1-2

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
RHC	6234,031.01		1/88		

Permeability of the Montara Granodiorite varies, depending on the depth of the rock, the degree of weathering, and fracturing. Permeability packer tests conducted within the weathered bedrock indicated that permeability ranged from about 1×10^{-3} cm/sec to 1×10^{-5} cm/sec. Slightly weathered to unweathered Montara Granodiorite generally has much lower permeability, ranging from 1×10^{-5} to 1×10^{-7} cm/sec or less (Purcell, Rhoades & Associates, 1987a).

A discontinuous zone of isolated bodies of metamorphic rock trending generally east-west bisects the site. This rock consists primarily of biotite-quartz-feldspar semischist, granofels, and biotite schists. Overall, the metamorphic rocks are of relatively high metamorphic grade, and probably represent the country rock into which the Montara Granodiorite was intruded (Purcell, Rhoades & Associates, 1987a).

The topographic and geologic conditions in Apanolio Canyon define two distinctly different regions of the canyon. The northern portion of the canyon is characterized by steep canyon walls with Apanolio Creek located in the bottom of the canyon. The steep nature of the canyon and stream channel have allowed minimal deposition of alluvial materials. In contrast, the southern portion of the canyon is characterized by steep side slopes with a broad alluvial canyon floor ranging from 100 feet to 300 feet in width. The more level topography along the floor of this portion of the canyon is due to deposition of alluvial materials by Apanolio Creek.

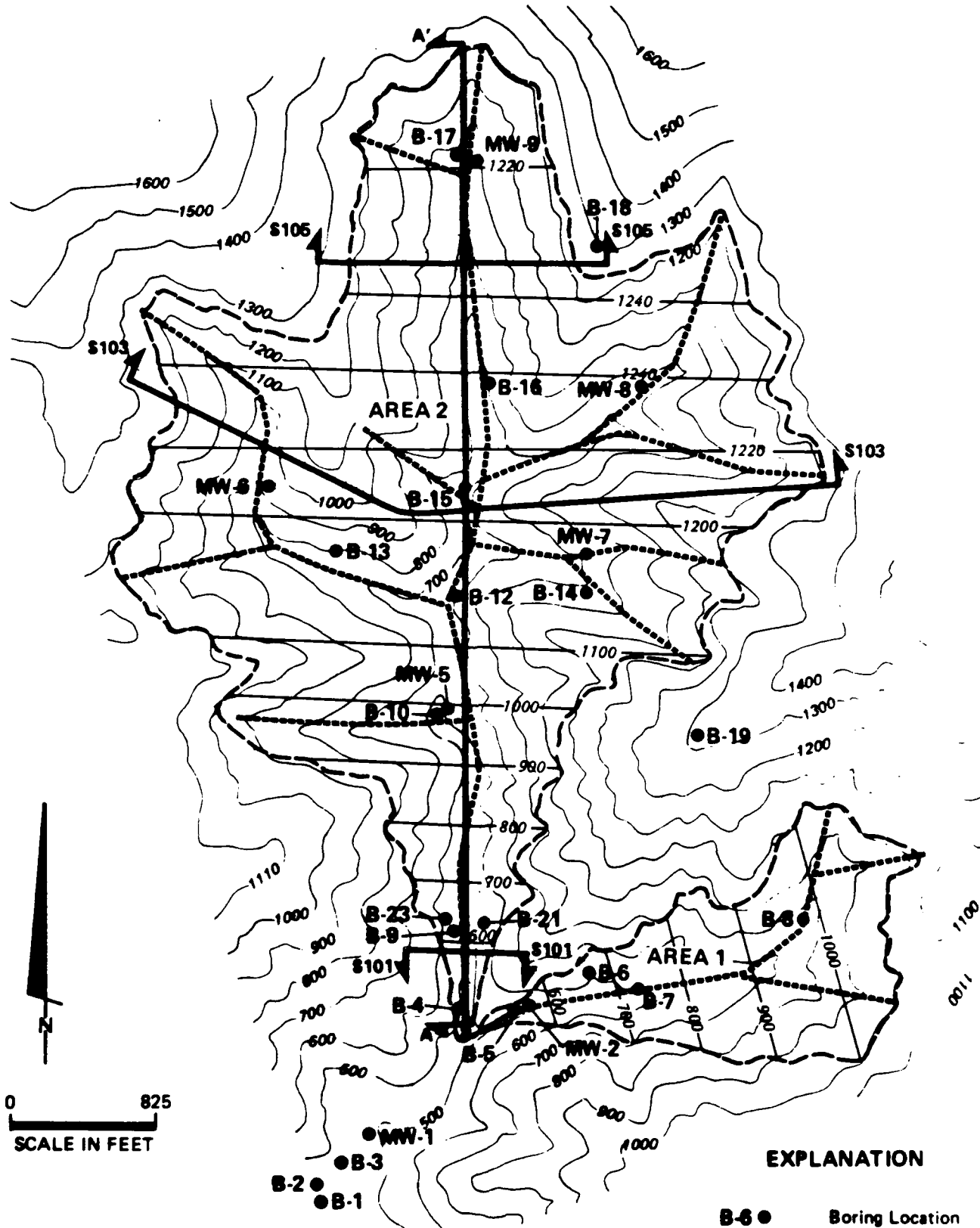
Alluvium in the northern portion of the canyon is confined to the creek channel and side canyon tributaries. This alluvium is composed of weathered

bedrock materials, primarily sand and silt sized particles with occasional clay or gravel layers. The alluvium in general averages 13 feet in thickness (ranging from 3 to 40 feet) with greater thicknesses near the southerly portion of the project area (Purcell, Rhoades & Associates, 1987a).

Colluvial soil is extensively distributed throughout the project area. Colluvium is thinnest on steep slopes and thickest at the base of slopes and, where present, averages 12 feet in thickness (ranging from 3 to 40 feet). The colluvial soil is usually a yellowish-brown, poorly sorted, silty sand. The material is well drained, allowing precipitation to percolate through the colluvium to the bedrock below (Purcell, Rhoades & Associates, 1986 and 1987a). Generally, dark gray residual soil overlies the colluvium in undisturbed areas.

To illustrate Apanolio Canyon morphology, a series of canyon cross sections were prepared. These sections were constructed using data obtained from ground-water well and geologic boring data generated during geotechnical investigation of the canyon. The location of each of these cross sections with respect to orientation of the proposed landfill is presented in Figure 4.1-3.

The depth of overburden (i.e., alluvium, colluvium and weathered bedrock) increases from as little as about 10 feet in some parts of the canyon floor to over 60 feet above the 1,200-foot elevation. Cross sections roughly perpendicular to the canyon axis were constructed for three areas; near the toe of the proposed fill, mid-project, and near the northern limit of fill, and are presented in Figure 4.1-4. These depictions of the



Source: Purcell, Rhodes & Associates, and Brian Kangas Foulk, 1987.



Harding Lawson Associates
Engineers and Geoscientists

Apanolio Canyon Geologic Section Locations
Ox Mountain Sanitary Landfill
Apanolio Canyon Expansion Site EIS
San Mateo County, California

FIGURE

4.1-3

DRAWN
CSN

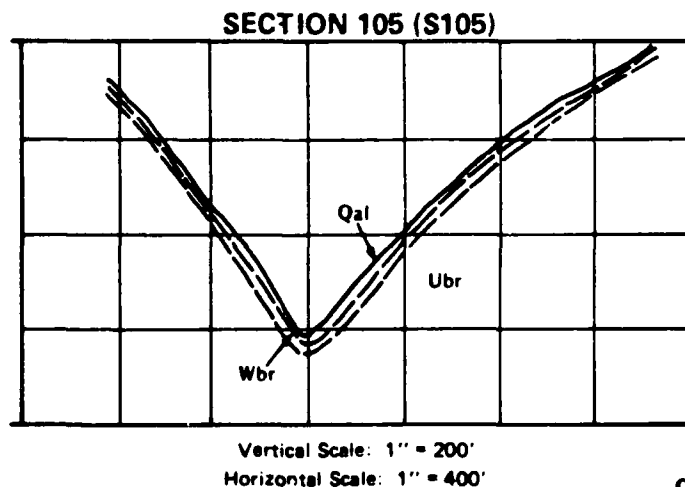
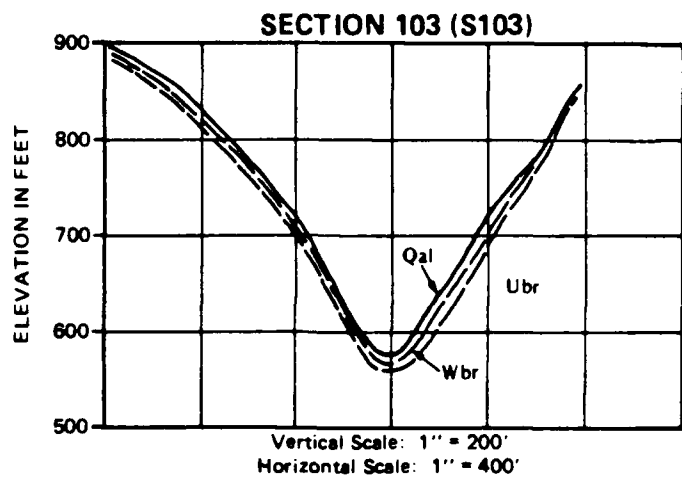
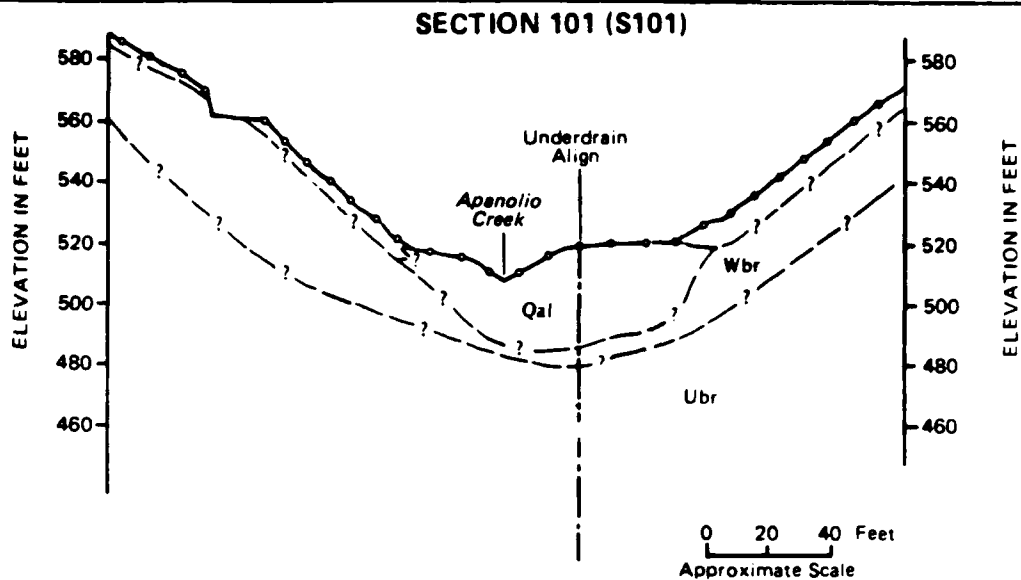
JOB NUMBER
6234,031.01

APPROVED

DATE
4/88

REVISED

DATE



EXPLANATION

- Qal - Alluvium/Colluvium
- Wbr - Weathered Bedrock
- Ubr - Unweathered Bedrock

Source: Purcell, Rhoades & Associates, 1987.



Harding Lawson Associates
Engineers and Geoscientists

Apanolio Canyon Geologic Cross Sections
Ox Mountain Sanitary Landfill
Apanolio Canyon Expansion Site EIS
San Mateo County, California

FIGURE

4.1-4

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
CSN	6234,031.01		2/88		

geologic characteristics of the canyon further illustrate the overburden depths near the toe of the landfill and the increasing depth of overburden (mostly weathered bedrock) as the canyon floor and side slope elevations increase.

Numerous landslides of various magnitude are present throughout the project area. The slides are generally associated with active seeps or springs. Most of the slides are relatively shallow (less than 10 feet thick) and involve only colluvial soils (Purcell, Rhoades & Associates, 1986). Due to the fractured and highly weathered nature of the Montara Granodiorite, bedrock landslides could occur. However, landslide deposits involving weathered or fresh bedrock have not been identified based on detailed geologic mapping to date (Murphy, pers. com., November 3, 1987).

Faults and Fractures

A review of published literature, subsurface borehole information, and detailed geologic mapping has indicated the absence of any potentially active faulting within the project area. Several small, older faults exist within the area, but offset along these faults is no more than a few feet. Data from rock borings indicate that numerous minor faults and shears exist at depth within the batholith and are likely associated with release of internal stresses produced during batholith formation and as a result of tectonic movement (Purcell, Rhoades & Associates, 1986).

Purcell, Rhoades & Associates (1986 and 1987a) investigated the possibility that the north trending main axis of Apanolio Canyon is fault controlled. However, detailed geologic mapping, angle hole test borings,

and geophysical surveys revealed no evidence of major faulting along this trend (Purcell, Rhoades & Associates, 1987b).

Seismicity

The nearest active faults to the project area are the San Andreas (2.7 miles) and Seal Cove-San Gregorio fault zones. The great San Francisco earthquake of April 18, 1906 was located along the San Andreas fault and a damaging earthquake on October 22, 1926 is believed to have been caused by a major displacement along the San Gregorio fault (Harding Lawson Associates, 1986). The maximum probable earthquake (MPE) for the San Andreas fault zone is Richter magnitude 8.3 (Purcell, Rhoades & Associates, 1986 and 1987a) and the maximum probable earthquake along the Seal Cove-San Gregorio fault zone is Richter magnitude 6.0 (Harding Lawson Associates, 1976). The maximum probable bedrock acceleration that could be experienced at the site is 0.5g (Purcell, Rhoades & Associates, 1986 and 1987a).

Studies by Thomson and Evernden (1986) and Borchardt et al. (1986) indicate that, in the event of a large magnitude earthquake, seismic shaking intensity may potentially be higher in sediment filled portions of canyons in San Mateo County than in areas underlain by bedrock. However, the actual intensity realized at the landfill site would likely be dependent, to a large degree, on the water content and composition of the sediment. Those sediments which are more likely to experience differential settlement or liquefaction would be most vulnerable to seismic shaking.

Erosion

Soils in Apanolio Canyon have formed from deep weathering of the underlying bedrock and are very erodible, particularly when vegetation is removed (Thomas Reid Associates, 1984). Although the Montara Granodiorite is very deeply weathered, it is not necessarily easily eroded. Large cuts in decomposed bedrock near the Corinda Los Trancos landfill have been exposed for several years and have been effected very little by erosion (Thomas Reid Associates, 1984). However, in locations where the bedrock is extensively fractured or jointed, the rock may more readily erode.

c. Corinda Los Trancos Canyon

Topography

The topography of Corinda Los Trancos Canyon in the forefill area is more gentle than that of Apanolio Canyon. The area is characterized by a broad alluvial valley trending roughly north-south and bounded to the east and west by ridges having slopes that average about 20 to 35 percent. The site is drained by Corinda Los Trancos Creek.

Geology

The geology of Corinda Los Trancos Canyon in the forefill area is very similar to that of Apanolio Canyon. The bedrock is the Montara Granodiorite also found in Apanolio Canyon. The geologic contact of the Montara Granodiorite with the Monterey Shale and Lompico Sandstone is within the canyon, approximately 400 feet south of the forefill area. Colluvial soil conditions are similar to those of upper portions of Apanolio Canyon. Landsliding is somewhat less extensive in this canyon compared to Apanolio

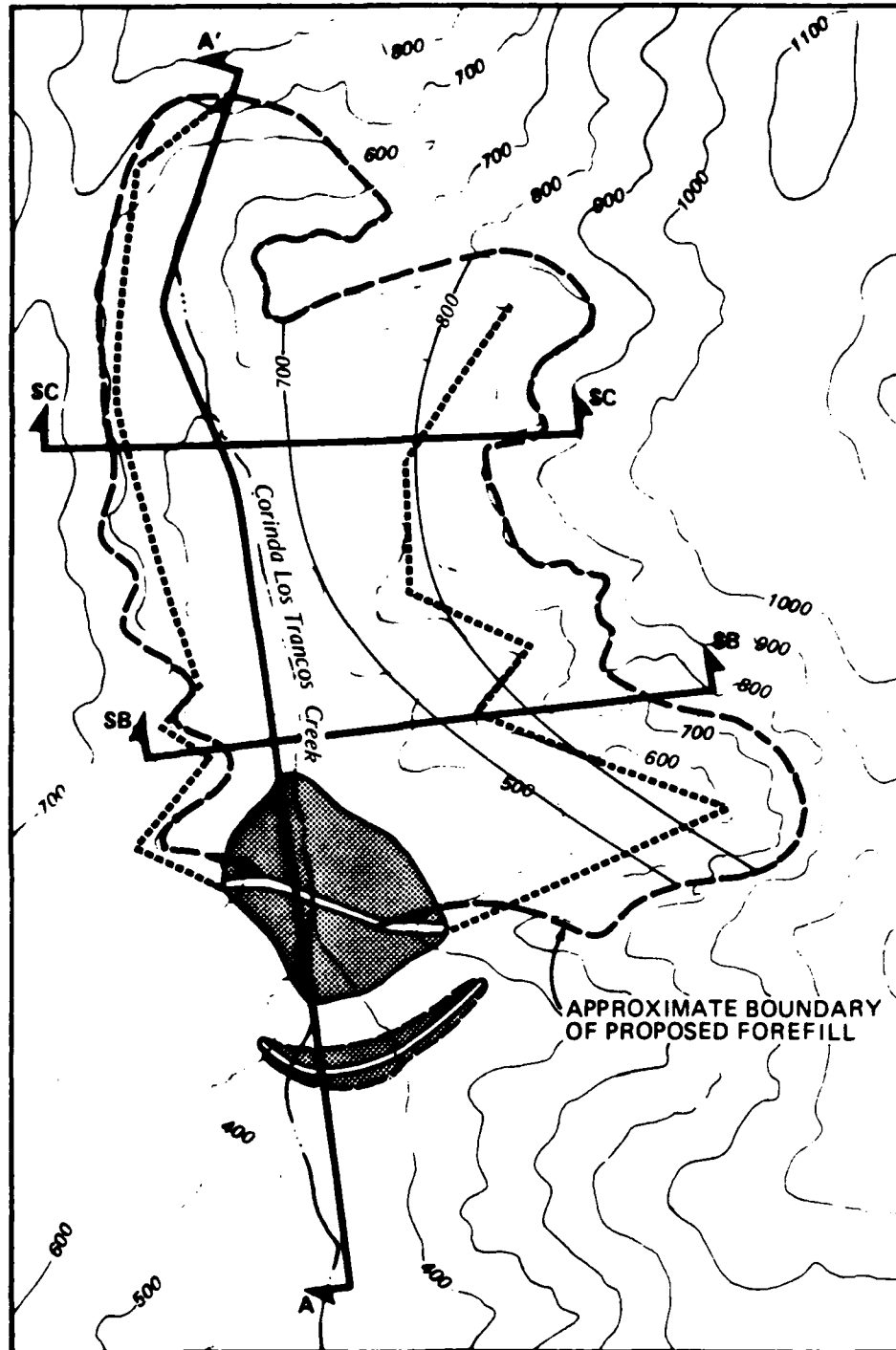
Canyon, due to the more gentle nature of the terrain. The thickness of the alluvium in the forefill area is much greater than that of Apanolio Canyon. Monitoring wells at the toe of the forefill area were drilled to a depth of up to 191 feet and encountered alluvial sediments ranging from 86 feet to 124 feet with extremely decomposed and weathered bedrock encountered below the alluvium (Purcell, Rhoades & Associates, 1987c).

Geologic cross sections for the proposed forefill area in Corinda Los Trancos Canyon were prepared using well, geologic boring, and canyon side slope data. The locations of these sections in relation to the proposed fill area are presented in Figure 4.1-5.

Cross sections perpendicular to the stream channel are illustrated in Figure 4.1-6. The total depth of alluvium and weathered bedrock approaches 180 feet near the toe of the forefill area as shown in section SB. Further north in the canyon, the depth of alluvial deposits and weathered bedrock shallows, but remains at approximately 140 feet as illustrated in section SC.

Faults and Fractures

Fault and fracture characteristics of Corinda Los Trancos Canyon are nearly identical to those of Apanolio Canyon. No evidence has been found in the forefill area to indicate potentially active faulting. The linear trend of the main drainage in Corinda Los Trancos Canyon and an apparent offset in the Lompico Sandstone indicates that the canyon could be fault controlled. However, surface geology and geophysical magnetometer data do not indicate the existence of a major north trending fault.



Source: Purcell, Rhoades & Associates, and Brian Kangas Foulk, 1987.



Harding Lawson Associates
Engineers and Geoscientists

Corinda Los Trancos Canyon Geologic Section Locations FIGURE
Ox Mountain Sanitary Landfill
Apanolio Canyon Expansion Site EIS
San Mateo County, California

4.1-5

DRAWN
CSN

JOB NUMBER
6234,031.01

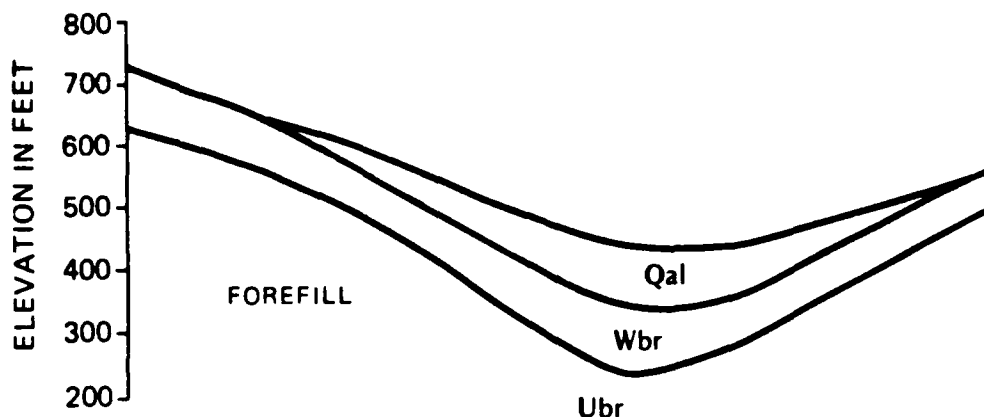
APPROVED

DATE
4/88

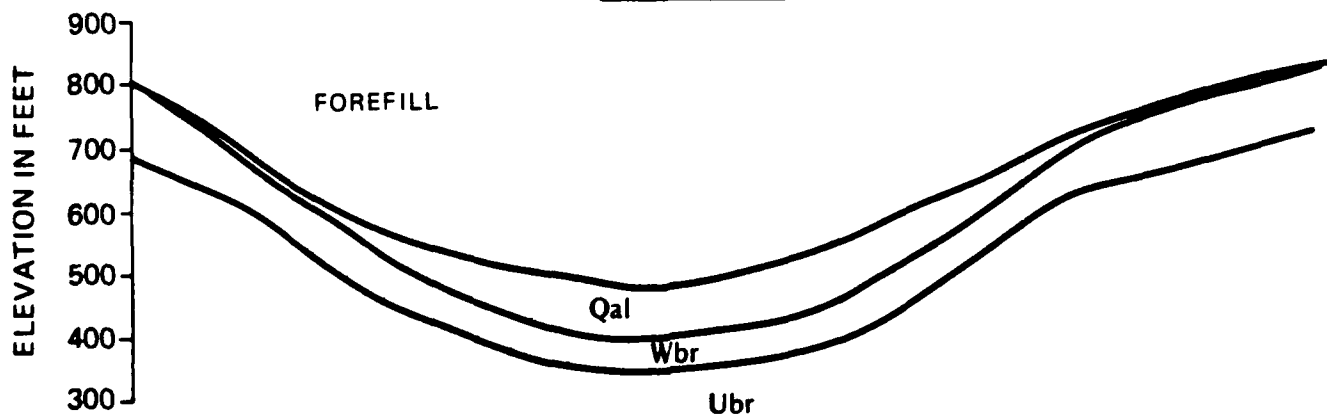
REVISED

DATE

SECTION SB



SECTION SC



HORIZONTAL AND VERTICAL SCALES EQUAL

Source: Purcell, Rhoades & Associates, 1987.

Qal - Alluvium/Colluvium
Wbr - Weathered Bedrock
Ubr - Unweathered Bedrock



Harding Lawson Associates
Engineers and Geoscientists

Corinda Los Trancos Canyon Geologic Cross Sections
Ox Mountain Sanitary Landfill
Apanolio Canyon Expansion Site EIS
San Mateo County, California

FIGURE

4.1-6

DRAWN
CSN

JOB NUMBER
6234,031.01

APPROVED

DATE
12/87

REVISED

DATE

Seismicity

The seismic conditions in Corinda Los Trancos Canyon at the forefill area are similar to those described for Apanolio Canyon. However, potential for seismic shaking may be greater in areas of the canyon underlain by a thick sequence of alluvium.

Erosion

Erosion potential in the Corinda Los Trancos Canyon forefill area is similar to that of Apanolio Canyon, but less severe due to the more gentle topography of the area.

d. Nuff Canyon

Topography

Similar to Apanolio Canyon, Nuff Canyon is characterized by steep terrain, with slopes ranging from about 20 to 100 percent. The main axis of Nuff Canyon trends roughly north-south and is drained by Nuff Creek.

Geology

Geologic conditions in Nuff Canyon are very similar to those of Apanolio Canyon. The bedrock is Montara Granodiorite and colluvial conditions are about the same as Apanolio Canyon. The depth of alluvium appears to be somewhat greater in the main drainage of Nuff Canyon than that of Apanolio Canyon.

No geologic boring information is available for Nuff Canyon. Therefore, to estimate the depth of alluvial sediments and weathered bedrock in the canyon, Purcell, Rhoades & Associates used the inclination of the canyon side slopes and existing topographic information to construct cross

sections. This technique was compared with Apanolio and Corinda Los Trancos Canyons, where subsurface information was available, and was found to correlate with existing well and boring information. The locations of these sections relative to the proposed landfill area are presented in Figure 4.1-7.

As illustrated in Figure 4.1-8, cross section SB, located near the toe of the proposed fill area, indicates the depth of alluvium and weathered bedrock exceeds 200 feet. A second cross section (SC) further north in Nuff Canyon (approximately 1,150 feet north of section SB) reveals that the depth of alluvium and weathered bedrock remain in excess of 200 feet, similar to depths near the toe of the proposed fill.

Faults and Fractures

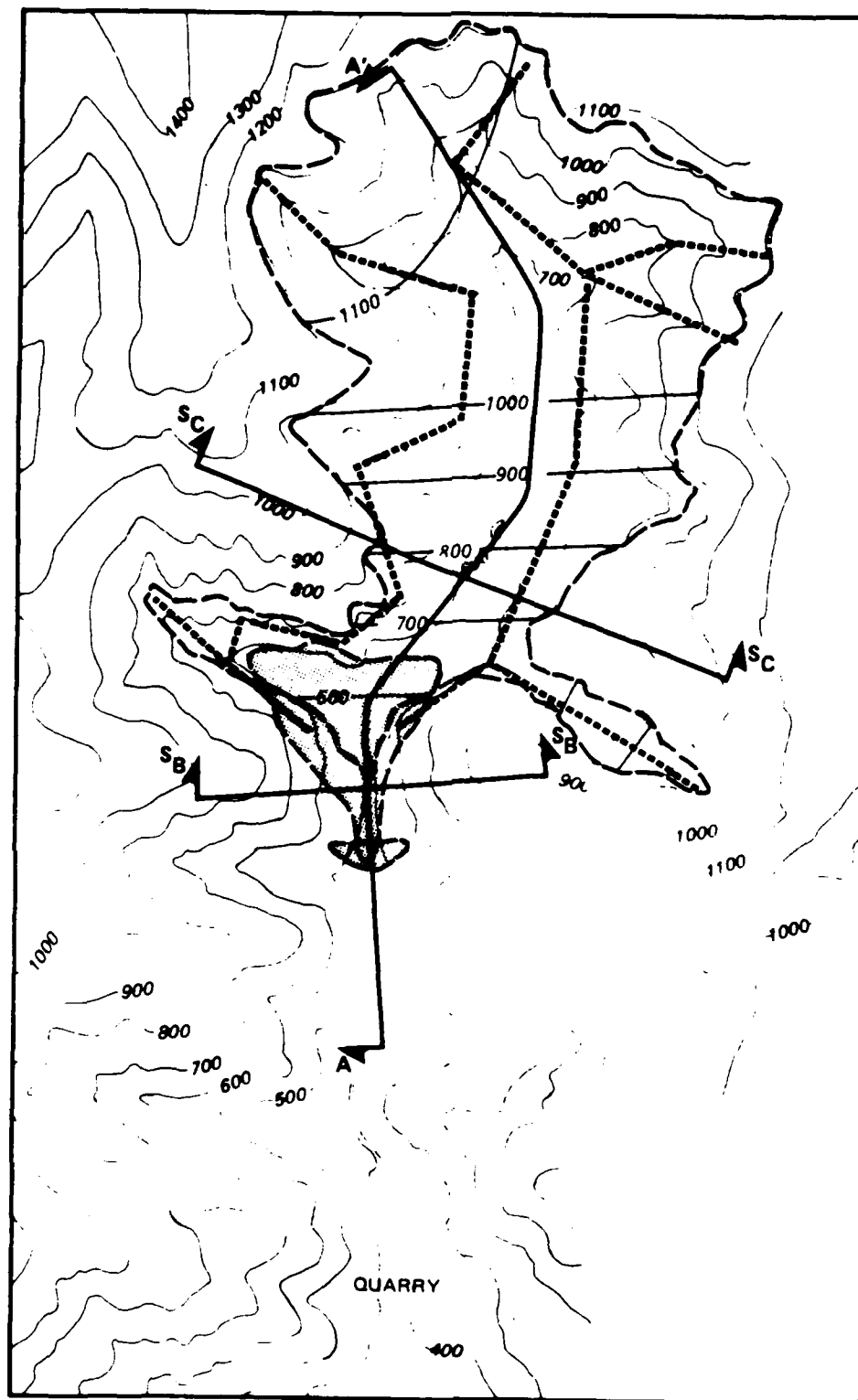
Faulting and fracturing in Nuff Canyon is similar to that in Apanolio Canyon. Currently, there is no evidence to suggest recently active faulting in Nuff Canyon.

Seismicity

The seismic conditions of Nuff Canyon are similar to those described for Apanolio Canyon. However, potential for seismic shaking may be greater in areas underlain by a thick sequence of alluvium and due to the closer distance (2.1 miles) of the canyon to the San Andreas fault system.

Erosion

Erosion potential in Nuff Canyon is very similar to that of Apanolio Canyon.



Source: Purcell, Rhoades & Associates, and Brian Kangas Foulk, 1987.



Harding Lawson Associates
Engineers and Geoscientists

Nuff Canyon Geologic Section Locations
Ox Mountain Sanitary Landfill
Apanolio Canyon Expansion Site EIS
San Mateo County, California

FIGURE

4.1-7

DRAWN
CSN

JOB NUMBER
6234,031.01

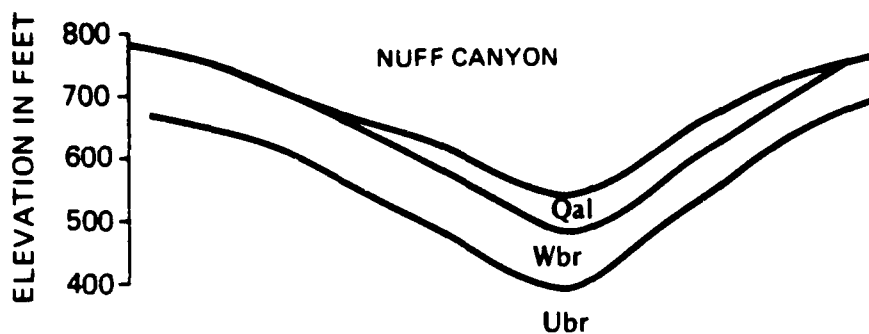
APPROVED

DATE
4/88

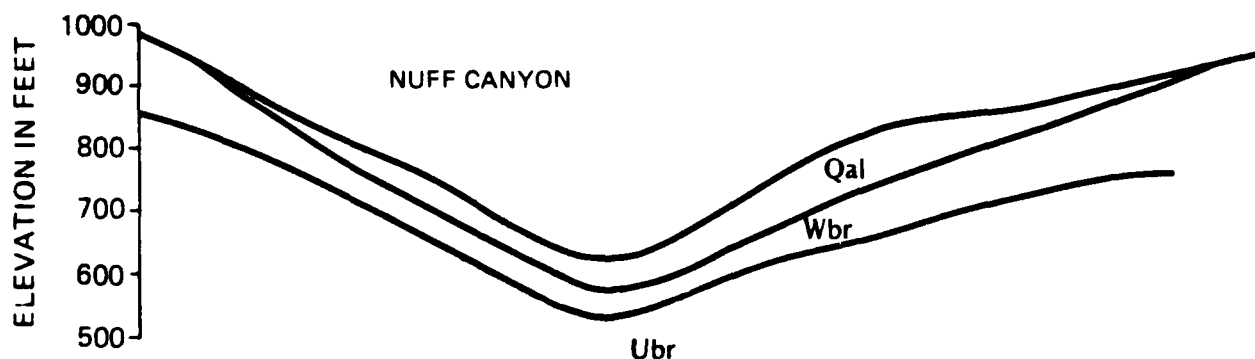
REVISED

DATE

SECTION SB



SECTION SC



HORIZONTAL AND VERTICAL SCALES EQUAL

Qal - Alluvium/Colluvium
Wbr - Weathered Bedrock
Ubr - Unweathered Bedrock

Source: Purcell, Rhoades & Associates, and Brian Kangas Foulk, 1987.



Harding Lawson Associates
Engineers and Geoscientists

Nuff Canyon Geologic Cross Sections
Ox Mountain Sanitary Landfill
Apanolio Canyon Expansion Site EIS
San Mateo County, California

FIGURE

4.1-8

DRAWN
CSN

JOB NUMBER
6234,031.01

APPROVED

DATE
12/87

REVISED

DATE

4.2 Hydrology and Water Quality

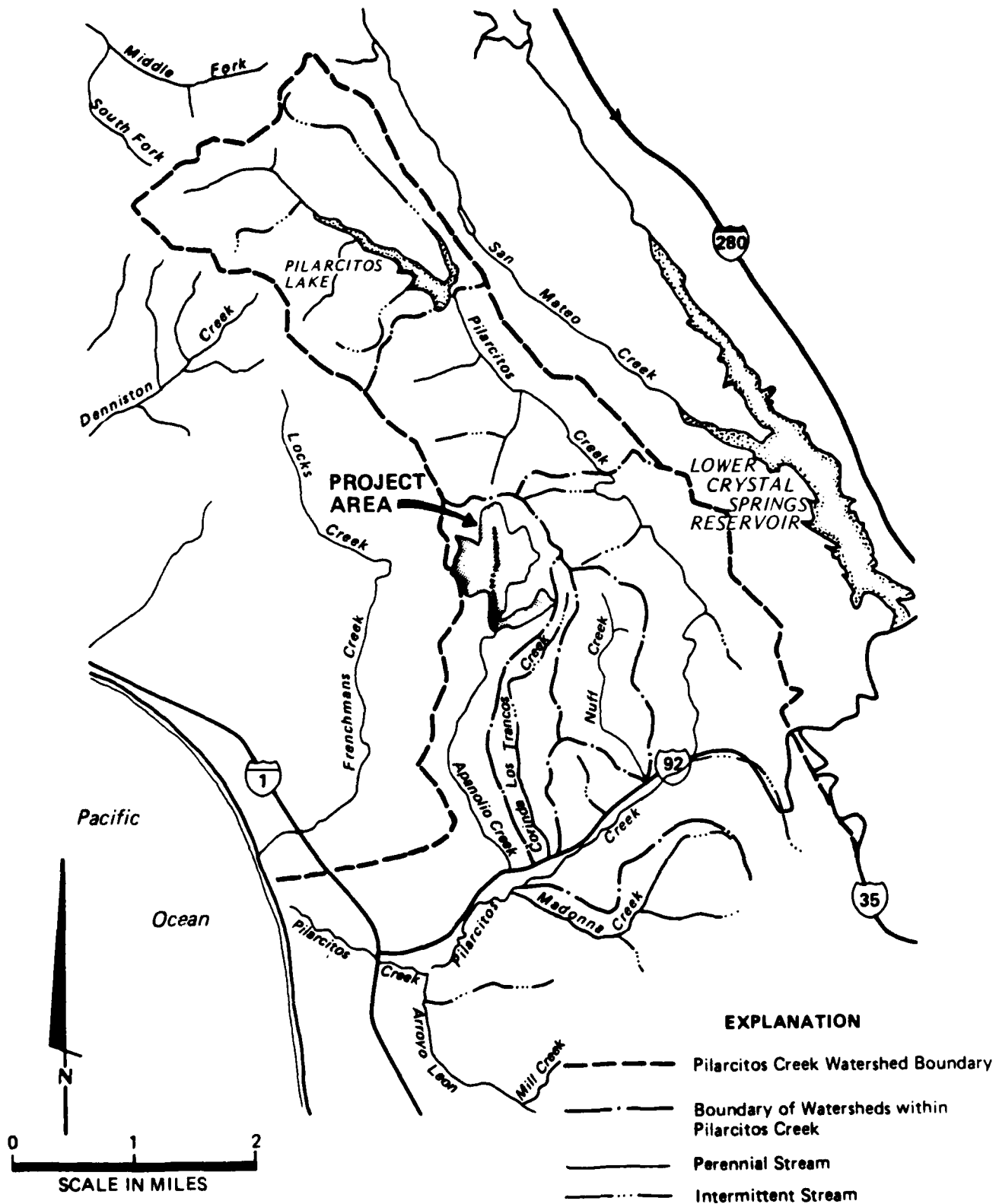
a. Regional

Hydrology

The project site lies within the Pilarcitos Creek Basin, located in the California Coastal Range, approximately 18 miles south of the San Francisco city limits. The northern portion of this basin is presented in Figure 4.2-1. In addition to Apanolio Canyon, the Corinda Los Trancos Canyon and Nuff Canyon alternative sites lie within the 17,408-acre Pilarcitos Creek Basin. *The Apanolio, Corinda Los Trancos, and Nuff Canyon basins encompass 1,346 (7.7 percent), 572 (3.3 percent), and 681 acres (3.9 percent), respectively.* Pilarcitos and Stone Dam Reservoirs are also within the basin. These two water supply reservoirs are owned and operated by the City of San Francisco.

The upper portion of the Pilarcitos Creek watershed, from Stone Dam Reservoir north to the watershed boundary, does not contribute runoff to the lower Pilarcitos Basin. Essentially all streamflows above the dam are diverted into Crystal Springs Reservoir, located in an adjacent watershed, for use by the San Francisco Water Department. The actual watershed area contributing to lower Pilarcitos Creek is approximately 7,590 acres; the Apanolio, Corinda Los Trancos, and Nuff Canyon basins account for *approximately 18, 7.5, and 9 percent of this effective watershed area, respectively.*

Within the lower Pilarcitos Creek Basin are several tributary streams with perennial flow: Nuff Creek (11,710 linear feet), Corinda Los Trancos Creek (7,540 feet), Apanolio Creek (16,260 feet), Madonna Creek (2,780 feet), Mills (15,600 feet), and Arroyo Leon (38,400). Streamflows from the



Harding Lawson Associates
Engineers and Geoscientists

Pilarcitos Creek Watershed (Northern Portion)
Ox Mountain Sanitary Landfill
Apanolio Canyon Expansion Site EIS
San Mateo County, California

FIGURE

4.2-1

DRAWN
CSN

JOB NUMBER
6234,031.01

APPROVED

DATE
11/87

REVISED

DATE

above tributaries are typically not measured or gaged. However, streamflows from lower Pilarcitos Creek have been gaged, near Half Moon Bay, since 1966 (USGS, 1985). During this period of record the mean annual streamflow has been approximately 16.5 cubic feet per second (cfs). Streamflows at the Pilarcitos Creek gage have ranged from zero cfs (common during dry seasons) on up to 4,750 cfs on January 4, 1982 (USGS, 1985). The latter recorded flow regime represents an extreme flood event.

Water Supply

Water Uses

The available surface- and ground-water supply in the Pilarcitos Creek Basin may support a number of beneficial uses, as identified by the Regional Water Quality Control Board (RWQCB). According to the Bay Basin Plan (1986), these uses may include:

- cold freshwater habitat
- warm freshwater habitat
- wildlife habitat
- fish migration and spawning
- water contact recreation
- non-contact water recreation
- municipal and domestic water supply
- industrial process supply
- agricultural water supply
- ground-water recharge

Currently surface waters are used primarily as cold freshwater habitat, wildlife habitat, for fish migration and spawning, and ground-water recharge. To a lesser degree the waters may provide warm freshwater habitat, water contact and non-contact recreation, municipal and domestic water supply.

Water Quality

Surface and ground waters of the Pilarcitos Creek Basin generally meet the Regional Water Quality Control Board's (RWQCB) water quality objectives for municipal and agricultural uses (RWQCB, 1986). These water quality objectives represent minimum/maximum desirable concentrations or readings (e.g., pH) for various water quality parameters and beneficial uses. A summary of the RWQCB's objectives for specific water quality parameters associated with municipal and agricultural beneficial uses is presented in Table 4.2-1.

b. Apanolio Canyon

Hydrology

The Apanolio Canyon Drainage Basin (hereafter referred to as the "Apanolio Basin," or simply "basin"), located approximately 1 mile northeast of Half Moon Bay, in San Mateo County, lies within the Pilarcitos Creek watershed. The basin, approximately 3 miles long and 3/4 of a mile wide, encompasses 1,346 acres. Apanolio Creek, the primary perennial stream within the basin, flows in a southerly direction, joining Pilarcitos Creek immediately upstream of the confluence of Pilarcitos and Madonna Creeks.

Apanolio Canyon and associated tributary canyons are predominantly steep sided, with 40 to 125 percent slopes. Topographic elevations in the basin range from 120 feet at Highway 92 to 1,747 feet at Ox Hill. Stream channel gradients (Apanolio Creek) range from 8 to 12 percent near the headwaters, decreasing to 1 to 2 percent near the confluence with Pilarcitos Creek (USGS, 7.5 minute quadrangle maps, Montara Mountain, California, and Half Moon Bay, California).

Table 4.2-1. Contaminant Levels and Standards for
Municipal and Agricultural Water Supplies^a

Parameter	Concentration	
	Municipal ^b	Agricultural ^c
Arsenic	0.05	0.1/2.0
Barium	1.0	--
Cadmium	0.010	0.01/0.05
Chromium	0.05	0.1/1.0
Copper	1.0	0.2/5.0
Cyanide	0.1/0.2	--
Fluoride	0.8-1.7	1.0/15.0
Iron	0.3	5.0/20.0
Lead	0.05	5.0/10.0
Manganese	0.05	0.2/10.0
Mercury	0.002	--
Nitrate (as NO ₃)	45.0	--
Selenium	0.01	0.02
Silver	0.05	--
Zinc	5.0	2.0/10.0
pH (standard units)	6.0-8.5	5.5-8.3/4.5-9.0
Specific Conductance (µmhos/cm)	900/1600	200/3000
Total Dissolved Solids	500/1000	(10,000)
Chloride	250/500	142/355
Sulfate	250/500	--
Total coliform	d	--
Turbidity (NTU)	1/5	--
Color (standard units)	15	--

- ^a Where two values appear (e.g., a/b), the first number represents a threshold concentration (where effects are noticeable) and the second represents a limiting concentration (where effects are undesirable). All single numbers represent limiting concentrations. All values expressed as mg/l except where noted. Numbers in parentheses are allowable concentrations for livestock watering.
- ^b All values taken from Title 22, California Administrative Code, except for cyanide and phenols, which were taken from the 1962 USPHS standards, and one pH, which was taken from McKee and Wolf, "Water Quality Criteria."
- ^c All values developed by the University of California Cooperative Extension Committee of Consultants, except pH, which was taken from McKee and Wolf, "Water Quality Criteria."
- ^d For nontidal waters, mean of <100 MPN/100 ml. For ground water, median of <2.2 MPN/100 ml.

Source: California Regional Water Quality Control Board, San Francisco Bay Region, December 17, 1986 Water Quality Control Plan Amendments.

The climatic conditions of the basin are typical of California's Coastal Range. Summers are warm and dry, but cool, foggy conditions prevail locally. Winters are cool and rainy. Much of the annual precipitation occurs between the months of December through April (Rantz, 1971). The RWQCB (1987) has previously reported that the average annual rainfall is estimated to be approximately 38 inches per year at the Apanolio Basin headwaters, and 32 inches per year near the confluence of Apanolio and Pilarcitos Creeks.

Streamflows within the basin are not usually gaged. However, hydrologic data developed by Hydrocomp, Inc. (1988) indicate that mean annual streamflows are approximately 697 acre-feet at the BFI property boundary. Most of the perennial flow in Apanolio Creek occurs downstream of the project site boundary. A summary of mean monthly streamflows for Apanolio Creek, also developed by Hydrocomp, Inc., is presented in Table 4.2-2.

Table 4.2-2. Mean Monthly Streamflows in Apanolio Creek

<u>Month</u>	<u>Discharge (Acre-feet)</u>
January	141
February	144
March	146
April	98
May	48
June	28
July	18
August	11
September	6.3
October	5.6
November	7.1
December	45

Source: "Storm Runoff and Sediment Management at the Apanolio Canyon Landfill," Hydrocomp, Inc., Jan. 1988.

Apanolio Creek flood flows are typically of short duration. Peak runoff usually occurs within 5 to 15 minutes after the period of maximum rainfall intensity. Peak flood flow discharges from Apanolio Creek (natural conditions), at once in 100-year frequency, are estimated to be 1,575 cfs (Table 4.2-3).

Table 4.2-3. Flood Frequency Analysis for Apanolio Creek Basin
(Natural Conditions)¹

<u>Flood Frequency</u>	<u>Peak Flow (cfs)</u>	<u>Hourly Flow (cfs)</u>	<u>Daily Flow (cfs)</u>
100-year return period	1575	585	125
50-year return period	1340	495	104
10-year return period	795	295	56
2-year return period	235	87	14

¹ Flows reported are at BFI property line.

Source: "Storm Runoff and Sediment Management at the Apanolio Canyon Landfill," Hydrocomp, Inc., Jan. 1988.

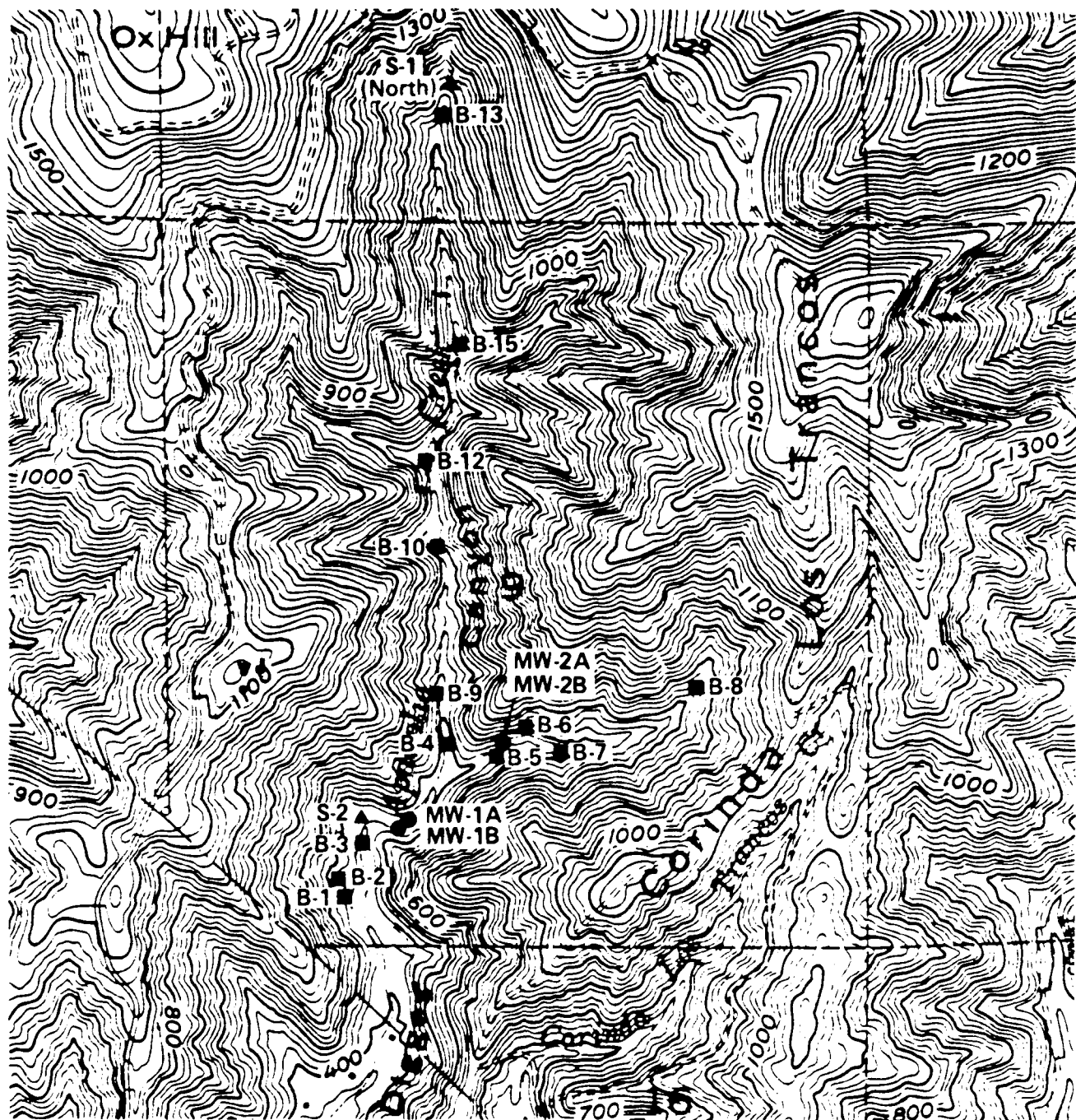
The combination of the Basin's steep slopes and erodible soils frequently results in turbid streamflows during major storm events (Thomas Reid Associates, 1984). Potential sediment sources include upslope areas and stream channel banks, both of which are composed of unconsolidated material consisting of silt, sand, and occasional gravel. The average annual sediment load from the upper Apanolio Basin is estimated to be 444 tons, or 0.7 tons per acre (Hydrocomp, Inc., 1988). Much of this material is probably transported during brief periods of high runoff.

The quantity and flow direction of ground water through the soils and bedrock fractures of the lower Apanolio Basin are not well documented. However, within the project site, ground-water conditions have been investigated by Purcell, Rhoades & Associates over the past two years (Purcell, Rhoades & Associates, 1987). Ground-water sampling results and

geohydrology analyses indicate that ground water in the northern canyon occurs in the alluvium, weathered to fresh bedrock, and to a limited extent in colluvium. Generally there seems to be a reasonably good hydrologic connection between these various units; however, there is some evidence that these units behave as separate aquifers, at least locally. Water in the bedrock occurs and moves almost exclusively in fractures. The orientation of these fractures creates anisotropy within the rock unit. Evidence of significant water movement is readily recognizable in cores and geologic logs by the degree of weathering present and in slightly weathered to fresh rock by iron oxide staining on the fractures. Unweathered bedrock shows little to no evidence of significant water movement (Purcell, Rhoades & Associates, 1987). The larger area of the landfill site would be located in the less permeable area of the upper main canyon and side canyons (Purcell, Rhoades & Associates, 1988).

Data collected by PRA suggest that beyond the periphery of the Apanolio Creek bed the water table rises at a gentle and variable gradient, depending on rainfall and local geologic conditions (e.g., the extent of bedrock fractures, weathering, and geographic location). Selected ground-water elevation data (equipotential map) are presented in Table 4.2-4, the associated sampling locations are presented in Figure 4.2-2.

Using available geologic and hydrologic information, Purcell, Rhoades & Associates evaluated the potential ground-water storage in the northern and southern portions of Apanolio Canyon. It was determined that the alluvial aquifer provides a ground-water storage of 4 acre-feet in the northern canyon and 64 acre-feet in the southern canyon. Based on the hydraulic



EXPLANATION

- ▲ S - Surface-water Quality Sampling Location
- MW - Monitoring Well (Ground-water Quality Sampling Location)
- B - Ground-water Elevation Sampling Location

0 1000 2000
SCALE IN FEET

Source: Purcell, Rhoades & Associates, 1986 and 1987.



Harding Lawson Associates
Engineers and Geoscientists

Apanolio Canyon Surface- and Ground-water Sampling Locations
Ox Mountain Sanitary Landfill
Apanolio Canyon Expansion Site EIS
San Mateo County, California

FIGURE

4.2-2

DRAWN
CSN

JOB NUMBER
6234,031.01

APPROVED

DATE
11/87

REVISED

DATE

gradient and conductivity of the northern canyon geologic units (i.e., alluvium, weathered bedrock, and unweathered bedrock), the annual ground-water discharge rates were determined. These calculations indicate that the alluvial, weathered bedrock and unweathered bedrock units discharge 21 acre-feet, 3 acre-feet, and 0.007 acre-feet per year, respectively. Comparatively, the larger alluvial aquifer in the southern portion of the canyon has a calculated flow of 23 acre-feet per year.

Table 4.2-4. Ground-Water Elevation
(Distance from Soil Surface to Ground-Water)
Data for Apanolio Canyon¹

<u>Sampling Location</u>	<u>Depth to Ground Water (feet)</u>	<u>Depth to Weathered Bedrock (feet)</u>
1	29	44
2	57.5	52
3	10.7 - 12.4	33
4	8.5 - 11.0	8
5	15.1 - 22.7	21
6	7.7 - 12.0	16
7	6.8 - 12.0	18
8	3.5 - Dry (well depth)	3
9	14.3 - 17.3	29
10	15.7 - 19.9	17
12	5.4 - 10.9	8
15	3.2 - 5.7	4
17	8.3 - 11.2	5

¹ Sampling dates April 1, 1985 - November 4, 1987.

Source: Purcell, Rhoades & Associates, December 30, 1987.

The alluvial valley fill in the southern portion of Apanolio Canyon comprises the aquifer of primary interest and importance as a water resource susceptible to contamination by the proposed landfill. The bedrock units in this portion of the canyon, although they may supply moderate amounts of water to the alluvial valley fill, are expected to provide low well yields and are not penetrated by any wells in the vicinity. The alluvial aquifer occupies approximately 121 acres and averages about 100 feet in thickness. The alluvium consists of fluvially deposited, weathered bedrock materials and alluvial fan deposits built up where side channels enter the valley. The fluvial deposits are composed of transitional lenses of sand and gravel interspersed with clay lenses. Wells in this aquifer would be expected to have good yields for private and limited agricultural use (Purcell, Rhoades & Associates, 1987).

Preliminary results from pump tests conducted by Purcell, Rhoades & Associates in lower Apanolio Canyon during February and March 1988 indicate the Apanolio Creek demonstrates hydraulic isolation from the lower canyon aquifer. Pump test graphs indicate that recharge does not occur between the stream and aquifer under test conditions (Purcell, Rhoades & Associates, 1988. *However, even though the stream appears to be isolated from the underlying aquifer, it is possible that limited ground-water recharge could be occurring at some location along the stream course.*

Table 4.2-5. Surface-Water Quality Data for Apanolio Basin^a

Parameter	Sampling Station ^b			
	S-1 ^c (North)	S-2 ^c	S-1 ^d (South)	S-5 ^d
Specific Conductance (µmhos/cm)	590-245	579-265.0	260	320
pH (standard units)	8.2-7.3	8.1-7.6	7.8	7.7
Total Dissolved Solids	310-150	391-180	240	260
Bicarbonate Alkalinity	150-87.5	151-95.0	76	80
Hardness	190-82	212-96	110	120
Calcium	43-15.8	62-15	28	28
Copper	<0.10	<0.10	<0.1	<0.1
Fluoride	NR	NR	0.16	0.13
Iron	0.89-0.01	0.84-<0.10	5.8	3.8
Magnesium	21-8.2	14.2-1.20	9.7	12.0
Manganese	<0.10	0.14-ND	0.13	0.08
Sodium	38-17.3	34-19.5	25	38
Zinc	<0.05	0.052-ND	<0.05	<0.05
Sulfate	280-8.5	41-9.5	17	20
Chloride	48-23.3	61-24.0	44	36
Nitrate (as N)	8.1-0.08	7.30-0.90	13	19
Asbestos (fibers/l)	NR	NR	500	700
Total Coliform (MPN/l)	NR	NR	≥1600	≥1600

a All values expressed as mg/l, except where noted.

b Sampling locations identified in Figure 4.2-2 and Figure 4.2-3.

c Data Source: Purcel, Rhoades & Associates, October 30, 1987. Data presented here represent the range of values obtained during 10 sampling events conducted between October 23, 1986 and September 14, 1987.

d Data Source: Purcell, Rhoades & Associates, May 21, 1986. Samples collected on February 27, 1986.

ND = Not detected.

NR = Not reported.

Table 4.2-6. Ground-Water Quality Data for Apanolio Basin^a

Parameter	Sampling Station ^b						
	MW-1A ^c	MW-1B ^c	MW-2A ^c	MW-2B ^c	G-1 ^d	G-2 ^d	G-5 ^d
Specific Conductance (μmhos/cm)	480-435	515-330	340-310.0	320-285.0	280	420	370
pH (standard units)	7.5-7.1	7.0-6.6	7.7-7.1	7.05-6.2	7.8	7.3	8.1
Total Dissolved Solids	323.0-260	423.5-210	262.0-210	423.5-170	240	340	270
Bicarbonate Alkalinity	132.5-120	223-100	128-110	110-99	80	120	100
Hardness	151.1-110	510-110	190-92	110-89	260	250	130
Calcium	32.8-21	43.0-24	57-27	25-20.4	88	72	32
Copper	<0.05	<0.05	0.12-ND	<0.05	<0.1	<0.1	<0.1
Fluoride	NR	NR	NR	NR	0.24	0.16	<0.1
Iron	1.5-1.05	300-2.2	190-2.7	16-2.0	4.5	0.13	0.27
Magnesium	16.2-13	22.5-12	12-6.0	14-9.0	9.7	17	12
Manganese	0.13-ND	3.2-0.09	2.7-0.19	0.27-ND	0.1	0.04	0.03
Sodium	48-36.9	40.3-23	37-19.2	32.5-23	38	64	32
Zinc	<0.05	0.75-ND	0.48-0.01	0.09-ND	0.27	<0.05	<0.05
Sulfate	31-22.0	14-10.0	59-12.5	22.5-6	17	38	28
Chloride	63.9-53	62.9-38	32.5-24	31.1-25	48	70	53
Nitrate (as N)	2.10-0.40	2.20-0.99	2.50-0.42	4.90-0.45	0.58	16	10
Asbestos (fibers/l)	NR	NR	NR	NR	4000	200	500
Total Coliform (MPN/l)	NR	NR	NR	NR	80	<2	240

^a All values expressed as mg/l, except where noted.

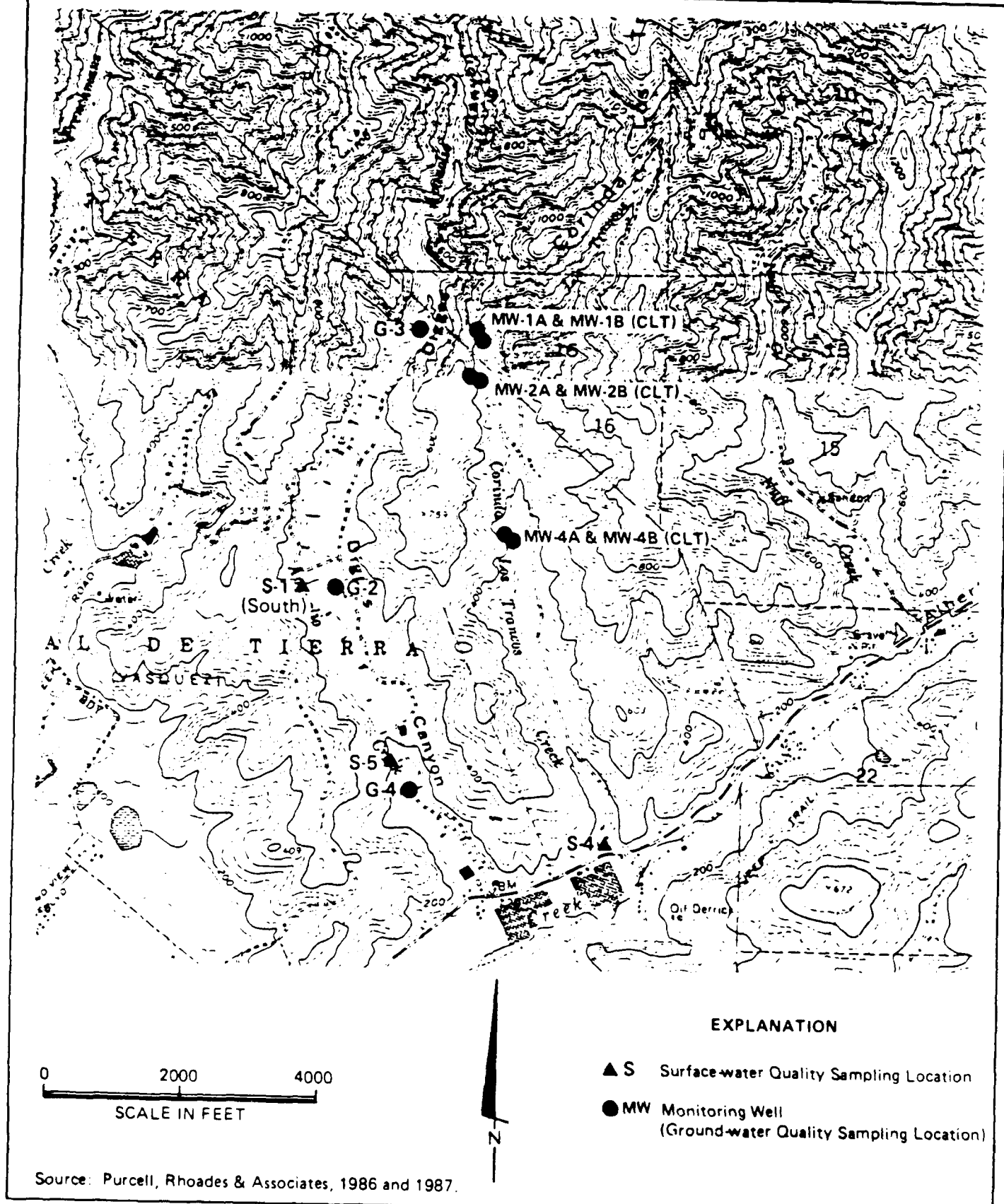
^b Sampling locations identified in Figure 4.2-2 and Figure 4.2-3.


^c Date Source: Purcell, Rhoades & Associates, October 30, 1987. Data presented here represent the range of values obtained during 5 sampling events conducted between April 26, 1987 and September 11, 1987.

^d Data Source: Purcell, Rhoades & Associates, May 21, 1986. Samples collected on February 27, 1986.

ND = Not detected.

NR = Not reported.



 Harding Lawson Associates Engineers and Geoscientists	Surface and Ground-water Sampling Locations Ox Mountain Sanitary Landfill Apanolio Canyon Expansion Site EIS San Mateo County, California		FIGURE
	<div style="text-align: right; font-size: 2em; font-weight: bold;">4.2-3</div>		
DRAWN CSN	JOB NUMBER 6234,031.01	APPROVED 	DATE 11/87
			REVISED
			DATE

Water Supply

Uses

Existing beneficial uses of ground and surface waters of the Apanolio Basin currently include utilization as fish and wildlife habitat, for crop irrigation (agricultural use), and as a source of domestic water supplies.

Water Quality

Quarterly ground-water and surface-water quality samples are currently being collected by PRA to define baseline water quality conditions in the Apanolio Basin (Table 4.2-5 and Table 4.2-6). Sampling locations are presented in Figures 4.2-2 and 4.2-3. Data collected to date suggest that, in one or two instances, the surface and ground waters within the project site, and the remainder of the Apanolio Basin, do not meet all the RWQCB's water quality objectives for municipal and agricultural uses without treatment. Water quality parameters that have exhibited concentrations that do not meet the RWQCB's water quality objectives for municipal and/or agricultural uses without treatment include iron, fluoride, manganese, and total coliform bacteria.

c. Corinda Los Trancos Canyon

Hydrology

The Corinda Los Trancos Canyon Drainage Basin (hereafter identified as the Corinda Los Trancos Basin), like Apanolio Canyon drainage basin, lies in the Pilarcitos Creek watershed. Thomas Reid Associates (1984) reported that the basin encompasses approximately 572 acres. Corinda Los Trancos Creek, which flows in a southerly direction through the canyon, is the only

perennial stream in the Corinda Los Trancos Basin (CDF&G, 1987). Corinda Los Trancos Creek joins Pilarcitos Creek approximately 1/2 mile upstream of the Apanolio Creek-Pilarcitos Creek confluence.

Like the adjacent Apanolio Canyon, Corinda Los Trancos Canyon is relatively long and narrow (approximately 2.5 miles long, 0.35 mile wide) with slopes averaging about 20 to 35 percent, except in the vicinity of the existing landfill, where even steeper slopes prevail. Topographic elevations in the basin range from 140 to 1,740 feet. Soils are generally moderate to highly erosive. The climatic conditions in Corinda Los Trancos Canyon are very similar to conditions observed in Apanolio Canyon, with much of the annual precipitation occurring between the months of December through April.

Streamflows within the basin are not routinely gaged; however, based on available data (approximate surface areas of Apanolio and Corinda Los Trancos basins, and Hydrocomp, Inc. (1988) streamflow estimates for Apanolio Creek), it appears that mean annual streamflows for Corinda Los Trancos Creek are approximately 0.82 cfs. Similarly, flood flows are probably slightly less than any given flood flow discharge predicted in Apanolio Canyon (see Table 4.2-3).

Unlike upper Apanolio Canyon, portions of the Corinda Los Trancos Canyon Basin have been developed, primarily in conjunction with the development and operation of the existing BFI Landfill and limited agricultural activities in the lower basin (cultivation of Christmas trees). These activities have accelerated soil erosion rates, resulting in increased deposition of

sediment (e.g., aggradation) in the Corinda Los Trancos Creek channel. Annual sediment loads, on a per acre basis, from the Corinda Los Trancos Basin are possibly greater than the 0.7 tons per acre per year estimate for the relatively undisturbed upper Apanolio Canyon.

The ground-water conditions within the Corinda Los Trancos Basin have been recently documented and analyzed (Purcell, Rhoades & Associates, 1987d). Results of the PRA report indicate that ground-water movement is nearly parallel to the surface topography and that one continuous aquifer exists from the surface downward. Sporadic and isolated springs and seeps are located in the basin. These ground-water sources, along with fog drip, maintain Corinda Los Trancos Creek's minor streamflows throughout the dry summers.

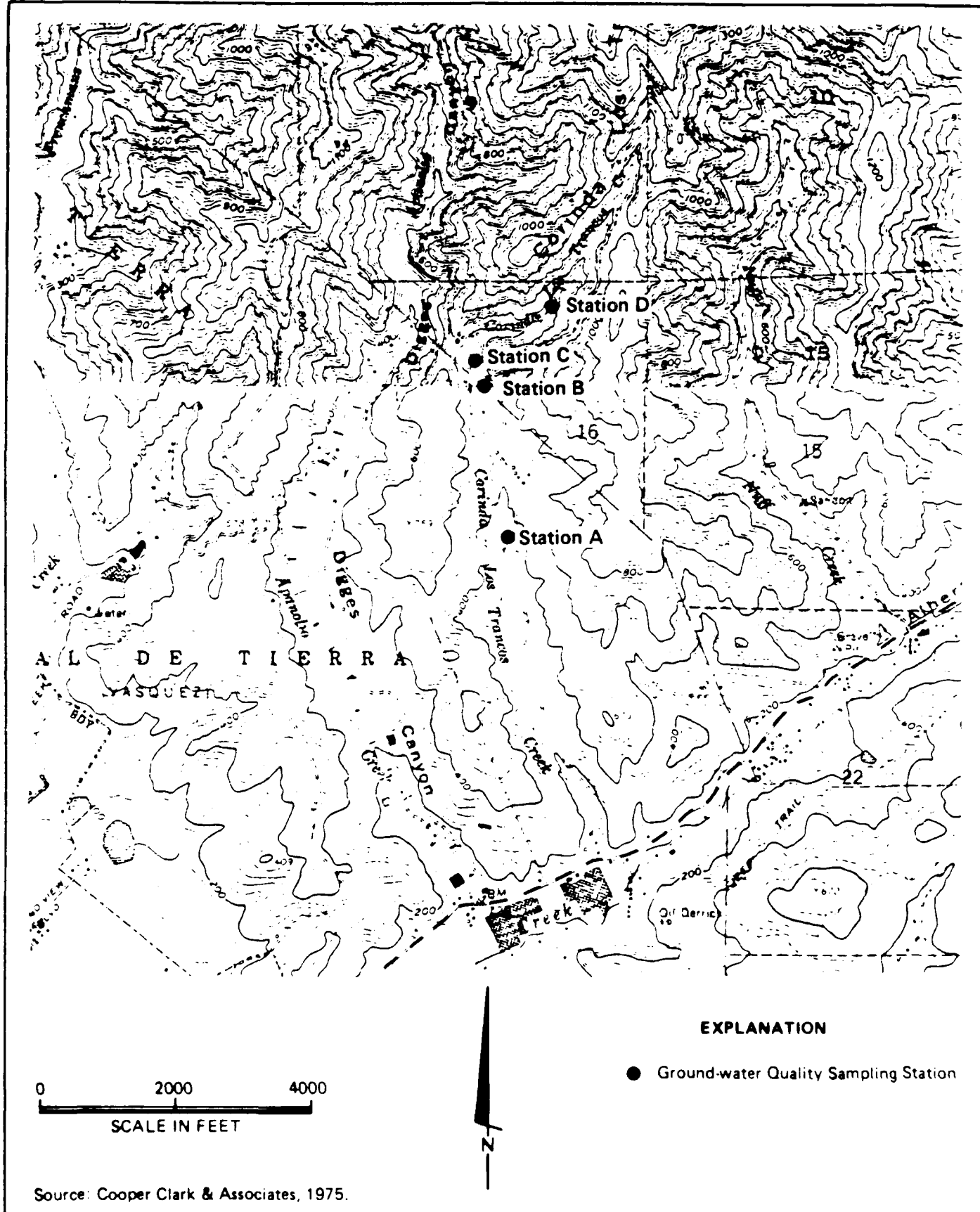
Water Supply

Uses

The current beneficial use of surface and ground waters of the Corinda Los Trancos Basin is crop irrigation. Additionally, ground water is used as a non-domestic water supply for a caretaker residence, located midway between the existing landfill and Highway 92.

Water Quality

In 1975, water quality of surface and ground water in Corinda Los Trancos Canyon was analyzed prior to construction of the landfill. The results of these analyses are presented in Table 4.2-7 and the sample locations are shown on Figure 4.2-4. These data indicate that the water quality was within municipal and agricultural standards for all constituents tested except iron.



HLA Harding Lawson Associates
Engineers and Geoscientists

Corinda Los Trancos Canyon Ground-water Sampling Stations
Ox Mountain Sanitary Landfill
Apanolio Canyon Expansion Site EIS
San Mateo County, California

FIGURE

4.2-4

DRAWN

JOB NUMBER

APPROVED

DATE

REVISED

DATE

CSN

6234,031.01

11/87

Table 4.2-7. Ground-water Constituent Analysis,
Corinda Los Trancos Canyon (Prior to
Landfill Construction)^a

Determination	Concentrations (Milligrams per Liter)			
	Station A	Station B	Station C	Station D
Nitrate	0.8	1.8	1.4	1.5
Chloride	37.0	32.0	38.0	37.0
Sulfate	12.0	10.0	17.0	20.0
Sodium	35.0	36.0	24.0	24.0
Potassium	1.0	1.2	1.0	1.4
Iron	116.0	13.5	4.1	3.5
Bicarbonate Alkalinity	110.0	246.0	98.0	71.0
pH (standard units)	7.24	6.95	7.90	7.75
Hardness	110.0	200.0	87.0	98.0
Total Dissolved Solids ¹	198.0	292.0	193.0	184.0
Specific Conductance (mmhos/cm)	299.0	435.0	276.0	267.0

^a All values expressed as mg/l, except where noted.

¹ Total Dissolved Solids (TDS) is a sum of the concentrations of all nonfilterable organic and inorganic materials.

Source: Cooper Clark & Associates, 1975.

The surface- and ground-water quality conditions of the Corinda Los Trancos Basin have continued to be monitored since landfill construction in accordance with the RWQCB's waste discharge requirements (WDR) Order No. 87-047. Water quality conditions are routinely monitored to detect any occurrences of leachate movement from the landfill. Selected ground-water sampling stations for the WDR, as well as surface-water sampling location, are presented in Figure 4.2-3. Water quality protection standards have been developed for the site (EMCON Associates, 1987) as required by WDR Order No. 87-047. A summary table of water analyses results is presented in Table 4.2-8.

Table 4.2-8. Surface and Ground-Water Quality Data for Corinda Los Trancos Basina

Parameter	Sampling Station ^b						
	S-4 ^c	MW-1A ^d (CLT)	MW-1B ^d (CLT)	MW-2A ^d (CLT)	MW-2B ^d (CLT)	MW-4A ^d (CLT)	MW-4B ^d (CLT)
Specific Conductance (µmhos/cm)	370	1700-2100	1400-1600	500-680	390-580	390-430	660-1900
pH (standard units)	7.9	6.4-6.5	6.3-6.7	6.4-7.2	7.7-8.2	6.6-7.5	10.2-11.8
Total Dissolved Solids	230	1000-1600	740-1400	340-520	310-580	230-400	440-780
Bicarbonate Alkalinity	120	830-1000	700-800	190-230	150-170	100-110	190-390
Hardness ^e	150	850	670	220	170	130	120
Calcium ^e	40	NR	NR	NR	NR	NR	NR
Copper ^e	<0.1	0.01	0.08	<0.01	0.01	<0.01	0.01
Fluoride	0.16	0.31-0.35	0.24-0.48	0.17-0.23	1.3-1.5	0.34-0.43	7.2-32
Iron	9.5	80-120	2.2-120	<0.05-20	<0.05-38	<0.05-18	<0.05-2.9
Magnesium	12.0	NR	NR	NR	NR	NR	NR
Manganese	0.58	8.4-10	4.6-6.7	0.42-0.98	<0.05-0.45	<0.05-2.7	<0.05
Sodium	45	82-140	90-110	38-46	85-100	34-43	19-200
Zinc	<0.05	<0.01-0.24	<0.01-3.8	<0.01-0.18	<0.01-0.73	<0.01-0.09	<0.01-0.58
Sulfate	38	8.0	4.3-15	12-18	17-45	24-29	24-81
Chloride	37	71-200	55-190	46-62	32-36	40-44	35-46
Nitrate (as N) ^e	10	<0.03	0.03	0.15	0.32	0.55	0.18
Asbestos (fibers/l) ^e	500	NR	NR	NR	NR	NR	NR
Total Coliform (MPN/l) ^e	>1600	NR	NR	NR	NR	NR	NR

^a All values expressed as mg/l, except where noted.^b Sampling locations identified in Figure 4.2-2 and Figure 4.2-3.^c Data Source: Purcell, Rhoades and Associates, May 21, 1986. Samples collected on February 27, 1986.^d Data Source: EMCON Associates, September 1987. Samples collected May, July, and August 1987.^e Data Source: Purcell, Rhoades and Associates, August 26, 1987. Samples collected May 1987.

These data suggest that water quality has deteriorated in Corinda Los Trancos Canyon only near the toe of the landfill since the 1975 sampling. For example, the concentration of total dissolved solids (TDS) in two wells near the toe of the landfill (MW-1A and MW-1B) has increased. Many of the water quality parameters sampled in 1987; notably iron, fluoride, manganese, total dissolved solids, and coliform bacteria frequently exhibit concentrations that do not meet the RWQCB's water quality objectives for municipal and/or agricultural uses. Water quality conditions in lower portions of the Corinda Los Trancos Basin may be varying in response to localized changes in bedrock geochemistry, operation of the existing landfill, and other land use activities (e.g., agriculture).

In addition to surface- and ground-water quality, the chemical composition of the existing landfill's leachate is monitored. Leachate from the existing landfill typically contains concentrations of total dissolved solids and various EPA priority pollutants. Representative sampling results are presented in Table 4.2-9.

d. Nuff Canyon

Hydrology

The 1.75 by 0.6 mile Nuff Canyon Basin, which lies immediately east of Corinda Los Trancos Canyon, encompasses approximately 681 acres. Topographic elevations in the basin range from 200 to 1,600 feet. Slopes along the perimeter of the "bowl shaped" basin typically range from 20 to 100 percent. Soils are generally moderate to highly erosive. Nuff Creek, the perennial stream within the Nuff Canyon Basin, flows in a southerly

Table 4.2-9. Leachate Analysis Results.
Upper and Lower Leachate Collection Tanks,
Corinda Los Trancos Canyon Landfill^a

Parameter	Constituent Concentrations	
	Upper Tank	Lower Tank
Bicarbonate Alkalinity	8,000	3,000
Chloride	1,300	1,300
Biochemical Oxygen Demand	1,900	260
Hardness	7,000	--
Iron	560	0
Manganese	100	540
pH (standard units)	7.3	9.2
Sodium	850	490
Total Dissolved Solids	18,000	3,600
Specific Conductance (μ mhos/cm)	15,000	6,900
Sulfate	15	30
Nitrate	<1	4.8
Arsenic	0.05	0.062
Cadmium	0.05	0.05
Total Chromium	0.15	0.05
Copper	<0.1	<0.1
Fluoride	510	1.8
Lead	<0.005	0.11
Mercury	<0.001	<0.001
Nickel	0.65	0.15
Selenium	0.60	0.026
Silver	0.075	0.05
Zinc	7.1	1.3

Selected EPA Organic Priority Pollutants^b

Benzene (μ g/l)	48	<5
trans-1,2-Dichloroethane (μ g/l)	430	<5
Ethylbenzene (μ g/l)	78	<5
Methylene chloride (μ g/l)	940	<5
Tetrachloroethene (μ g/l)	42	<5
Trichloroethene (μ g/l)	73	<5
Toluene (μ g/l)	480	<5

^a Values expressed as mg/l, except where noted (parts per million).

^b Values expressed as μ g/l (parts per billion).

Source: Purcell, Rhoades & Associates, August 26, 1987.

direction, joining Pilarcitos Creek approximately 1 mile upstream of the Apanolio Creek-Pilarcitos Creek confluence.

The climatic conditions in Nuff Canyon are very similar to conditions observed in Apanolio Canyon. Much of the annual precipitation occurs between the months of December through April. Streamflows within the basin are rarely gaged; however, based on available data (approximate surface areas of Apanolio and Nuff Canyon basin, and Hydrocomp, Inc., (1988) streamflow estimates for Apanolio Creek), it appears that the mean annual streamflows for Nuff Creek are approximately 705 acre-feet.

To date, the most significant land use activity in the basin, from a hydrologic and water quality perspective, is the ongoing quarry operation. Soil erosion from the 40-acre quarry, as well as bank failures along portions of Nuff Creek and associated tributaries, appear to be the primary source of sediment from the basin. Much of this sediment is captured in a series of sediment traps located immediately downstream of the quarry. Annual sediment loads from the upper basin into the quarry's sediment traps are probably greater than the 0.7 tons per acre per year sediment load estimated for the relatively undisturbed upper Apanolio Canyon. However, sediment loads on a per acre basis, downstream of the quarry's sediment traps, may be comparable to the 0.7 tons per acre per year estimate for Upper Apanolio Canyon.

The lack of available data precludes a detailed characterization of ground-water conditions in the Nuff Canyon Basin. Neither the direction nor ground-water flow rates through the soils, colluvium, and/or potential bedrock fractures of the basin have been documented.

Water Supply

Uses

Beneficial uses of ground and surface waters of Nuff Canyon are utilization as wildlife habitat, for quarry-related operations, a potential domestic use at a cabin located south of the quarry operation, and to a lesser extent, as a water source for livestock. The existing quarry operation, the primary user of the basin's surface and ground waters, currently uses approximately 11,000 gallons of water per day for dust control and plant processes.

Water Quality

The ground- and surface-water quality conditions in Nuff Canyon have not been documented; however, due to the physical similarities and close proximity of the Nuff, Apanolio, and Corinda Los Trancos Basins, it is assumed that water quality conditions in Nuff Canyon are in the range of those observed in the Apanolio and Corinda Los Trancos Basins. The impact of quarry operations on water quality in Nuff Canyon is unknown.

4.3 Biology

4.3.1 Vegetation

a. Regional

The Pilarcitos Creek watershed supports a range of plant communities typical of the coastal mountains of San Mateo and Santa Cruz Counties. Both the complexity and diversity of the plant communities are partially attributed to the basin's diverse physical conditions (e.g., topography,

soils, exposure) and the extent of past disturbance and land use history (e.g., fire, agriculture). Representative plant communities within the watershed include riparian woodlands; Douglas fir forest; coastal chaparral; coastal scrub consisting of coyote brush, with lesser amounts of coffeeberry, poison oak, toyon, redberry, and holly-leaved cherry; exotic forest, including Monterey pines and eucalyptus; mixed evergreen woodland comprised of coast live oak, madrone, and California bay-laurel; and grasslands.

Well-developed riparian woodlands are found along much of the Pilarcitos Creek stream channel, upstream of the Nuff Creek confluence, and in some tributary drainages. Dominant canopy trees include red alder, big leaf maple, and willow. Less developed riparian woodlands dominated by willow thickets and small alders, are found along the basin's intermittent stream channels, and areas subject to periodic disturbances (e.g., lateral stream channel movement and/or land use activities). Understory vegetation typically associated with these riparian corridors includes western red dogwood, coastal elderberry, wild rose, bramble, sword fern, and a variety of sedges, rushes, and bulrushes.

b. Apanolio Canyon

Most of the major plant communities found in the coastal watersheds of San Mateo County are found in Apanolio Canyon: coastal scrub, riparian woodland, mixed evergreen forest, chaparral, and grassland. The diversity of plant species in Apanolio Canyon is at least partially attributed to the basin's location between the scrub-covered hills to the northwest,

grasslands to the southwest, and woodlands to the northeast and southeast (Thomas Reid Associates, 1984).

The downstream perennial reaches of Apanolio Creek (beginning with the lower three-fifths of the project site) support well-developed riparian woodlands. These woodland plant communities, which typically include red alder, willow, red elderberry, and an understory of herbaceous plants and woody shrubs often extend laterally on stream terraces, 100 feet or more, from Apanolio Creek. Much of the riparian vegetation along the upstream, intermittent portions of Apanolio Creek (located within the upper two-fifths of the project site) consists of willow thickets, small alders, sword fern, and nettle. The lateral extent of the riparian band is reduced substantially as one proceeds up the drainage course; toward the upper reaches of the creek and its tributaries riparian vegetation is confined to those narrowly incised channels associated with periodic streamflow.

The steep canyon walls of Apanolio Canyon support brushy chaparral communities on the southerly facing slopes. Deciduous and coniferous trees are densely grouped along the north faces of the various finger canyons, but widely scattered at the higher elevations, toward the head of the main canyon. There is also a dense stand of Douglas fir and stands of blue blossom *Ceanothus thyrsiflorus* along the rim road, where the basin's vegetation becomes contiguous with the large expanses of woodland extending up to Crystal Springs Reservoir. Plant species commonly found in Apanolio Canyon are listed in Appendix B.

Based on a detailed survey of Apanolio Canyon and analysis of wetland indicators following U.S. Army Corps of Engineers guidelines for determining wetlands, HLA (February, 1987) calculated that 3.26 acres of lands that potentially could be classified as "waters of the United States and adjacent wetlands" were found within the Apanolio Canyon development area. Through review of aerial photography, the Corps has determined that additional small ephemeral streams occur within the affected area of Apanolio Canyon and that a total of 3.43 acres is subject to Corps jurisdiction within the Apanolio Canyon development area (letter from Col. Andrew M. Perkins, Jr., Corps to Lino Valbusa dated April 24, 1987).

c. Corinda Los Trancos Canyon

The predominant plant communities found in Corinda Los Trancos Canyon are coastal scrub and grassland, and to a lesser extent, woodland and riparian, and wetland (Thomas Reid Associates, 1984). While the overall mix of plant species is about the same as found in Apanolio Canyon, a long history of disturbance and land use extending to the margins of the stream zone have resulted in a noticeably less diversely structured habitat.

Areas along the floor of the canyon have been disturbed by human activities such as cultivation, grazing, and road building. Currently, large portions of the relatively level canyon floor are used for Christmas tree production and limited grazing areas for domestic animals. A corridor of riparian vegetation occurs along the Corinda Los Trancos Creek channel. While this riparian band can be dense locally, sometimes extending up to 100 feet on either side of the creek, it is limited in extent along the

creek and is less developed than the riparian areas of Apanolio Canyon. Semi-mature willow thickets dominate the stream corridor as it winds through the Corinda Los Trancos Canyon. Lateral stream channel movement in the alluvial material that comprises the stream floodplain and land development have served to maintain the riparian corridor in this early successional state. *Since publication of the Draft EIS, a detailed wetlands analysis was conducted within the proposed alternative project area in Corinda Los Trancos Canyon. An analysis of wetland indicators, following U.S. Army Corps of Engineers guidelines for determining wetlands, was conducted along transects oriented perpendicular to the Corinda Los Trancos Creek channel. The transects, each approximately 50 feet in length, were used as references for the recording of stream channel, soil, and vegetation characteristics. Where channel characteristics were relatively uniform, transects were surveyed at 400-foot intervals. Transects also were established at locations where creek channel characteristics changed, regardless of interval length. Using field data, air photos, and topographic maps of the site, the extent of "waters of the United States and adjacent wetlands" was evaluated. This determination indicated that the site contains approximately 0.89 acre of area potentially subject to Corps' jurisdiction under Section 404 of the Clean Water Act.*

Upland vegetation along the Corinda Los Trancos drainage consists of typical coastal scrub and chaparral communities. Scattered stands of Douglas fir can be found, especially on west facing slopes. Because of their exposure, accessibility and land use history, the slopes adjacent to

Corinda Los Trancos do not support the diversity or density of vegetation found in Apanolio Canyon.

d. Nuff Canyon

Nuff Canyon, like Apanolio Canyon, is a major tributary drainage of the Pilarcitos Creek basin. Plant communities and wildlife habitats typical of the basin--coastal scrub, coastal chaparral, riparian woodland, mixed evergreen forest, and grasslands--are found along the perennial stream course (Nuff Creek) that flows through this canyon, along its several side canyons, and on the adjacent hillsides. The plant species that comprise these communities are essentially the same as those found in Apanolio Canyon (Appendix B). The character of Nuff Canyon has been influenced by a long history of human use, primarily for homesteading but also for sand and gravel quarrying near its downstream confluence with Pilarcitos Creek. An unpaved road, more or less following the course of the stream channel provides access to the upper reaches of the canyon where an old residence exists. Areas along the canyon floor have been cleared for pasture and non-native plants, notably eucalyptus and Monterey cypress have colonized available habitats. Extensive groves of eucalyptus occur along the creek channel proper, especially in its downstream reaches. Quarrying activities have removed most of the natural vegetation in an approximately 40-acre area of the lower canyon and Nuff Creek itself has been partially culverted through this area.

The canyon floor is relatively broad, ranging from 100 to 400 feet in width within the project area. Nuff Creek has incised a channel in the alluvial materials of the canyon floor and a riparian band, consisting

predominantly of alders, lines this channel along much of its length. The width of the riparian corridor varies through the canyon depending on the extent of clearing and grazing and on the extent of channel downcutting that has occurred over time. Since publication of the Draft EIS, a detailed wetlands analysis following the same procedures used in Corinda Los Trancos Canyon, was conducted within the proposed alternative project area in Nuff Canyon. An analysis of wetland indicators, following U.S. Army Corps of Engineers guidelines for determining wetlands, was conducted along transects oriented perpendicular to the Nuff Creek channel. The transects, each approximately 50 feet in length, were used as a reference for recording of stream channel, soil, and vegetation characteristics. Where channel characteristics were relatively uniform, transects were surveyed at 400-foot intervals. Transects also were established at locations where creek channel characteristics changed, regardless of interval length. Field data was collected in this manner for the southern portion of the proposed alternative site. The field study was not completed in the northern reaches of the Canyon since property owner permission for field team access was not granted. Therefore, the wetlands determination is based upon field data, air photo and topographic map interpretation, and assumptions of stream channel characteristics. The assumptions used for the drainages located in the northern portion of the site were based upon observations made in Nuff Canyon and the nearby Corinda Los Trancos and Apanolio Canyons. Using these data, the extent of "waters of the United States and adjacent wetlands" potentially subject to Corps' jurisdiction under Section 404 of the Clean Water Act was determined to be approximately 1.74 acres.

Upland vegetation in Nuff Canyon is similar to other canyons in the Half Moon Bay area and is controlled to a certain degree by the orientation of the canyon side slopes. Tree cover and brush are generally more prominent on the east-facing slopes than west-facing slopes, and northerly slopes have greater cover development than southerly facing slopes. Douglas fir trees are scattered throughout the canyon, but occur in greater numbers and in dense groups on the northerly facing slopes of the side canyons. Dense brush cover on the east-facing side of the Canyon consists primarily of wild blackberry, toyon, poison oak, coffeeberry, lupine, ceonothus, and coyote brush. On the west-facing side, the brush cover is typically not as dense and contains lower growing species including monkey flower, ceonothus, coyote brush, and sage. The northern boundary of the project site is occupied by more dense stands of Douglas fir, which extend up to the Crystal Springs Reservoir.

4.3.2 Wildlife

a. Regional

The Pilarcitos Creek Basin supports many of the same terrestrial wildlife species found in the nearby Santa Cruz Mountains: bobcat, fox, deer, skunk, raccoon, California quail, red-shouldered hawk, and great horned owl. Much of the available wildlife habitat is concentrated in the upper, relatively undisturbed, Pilarcitos Creek Basin. Since 1933, the wildlife of the upper Pilarcitos Creek Basin has been protected under the legislation that created the San Francisco Fish and Game Refuge.

b. Apanolio Canyon

A previous study identified a number of terrestrial animals known or thought to exist in Apanolio Canyon (Thomas Reid Associates, 1984). These species, presented in Appendix B, include carnivorous mammals such as bobcat and fox and raptors such as red-tailed hawks. Raptorial birds characteristic of streamside woodlands, e.g., red-shouldered hawks and black-shouldered kites, may also be present (Thomas Reid Associates, 1984). Other species observed or thought to exist in Apanolio Canyon include skunk, raccoon, black tail deer, brush rabbit, California quail, blue jay, and great horned owl.

The Canyon's dense vegetation and restricted public access, as well as the diversity of habitat types within the basin, are largely responsible for the diversity of terrestrial organisms observed.

c. Corinda Los Trancos Canyon

At one time, Corinda Los Trancos Canyon probably provided habitats for many of the same terrestrial animals found in Apanolio Canyon. Development of the landfill and associated human disturbances eliminated many habitats, and may have encouraged many of the more secretive animals to avoid the area.

The majority of the wildlife species commonly found in Corinda Los Trancos Canyon are probably animals that can easily adapt to the human presence (e.g., skunk, raccoon, brush rabbit, California quail, blue jay, and coastal deer).

d. Nuff Canyon

The habitat types in Nuff Canyon consist of open pasture/grasslands interspersed along an alder-dominated riparian corridor with scattered coastal Douglas fir, scrub, and chaparral communities along the side slopes. These habitat types support a variety of wildlife typical of the general area and may, in fact, provide better habitat for deer because of cleared pasturelands adjacent to upland chaparral and woodland cover. However, the intrusion of human activities and disturbance of habitat may have reduced the habitat value for more sensitive species. Development and operation of the quarry in the southern portion of Nuff Canyon has removed most of the natural wildlife habitat in that portion of the Canyon.

4.3.3 Aquatic

a. Regional

The Pilarcitos Creek basin supports aquatic species typical of the coastal drainages of the Santa Cruz Mountains, including the red-legged frog, Pacific tree frog, sculpin, three-spine stickleback, and various aquatic insects. Also found in the Pilarcitos Creek basin are rainbow and steelhead trout.

In recent years (1976 to 1984) the Pilarcitos Creek steelhead fishery has suffered from low stream flows and an incident involving improper chlorine discharges from the mid-coastside sewage treatment plant at the mouth of Pilarcitos Creek which had either killed migrating fish, or more likely, caused them to avoid entering the Creek (Thomas Reid Associates, 1984). According to the California Department of Fish and Game (CDFG), the

fish populations of the Pilarcitos Basin are beginning to recover from these recent droughts and pollution discharges (Linda Ulmer, CDFG, 1987).

b. Apanolio Canyon

Apanolio Creek and its associated intermittent tributaries provide good habitat for the range of aquatic species found in the Pilarcitos Creek basin. At one time steelhead trout may have utilized most of the perennial, and portions of the intermittent reaches of the Apanolio Creek stream channel for spawning and rearing habitat. However, a diversion structure, built 50-years ago, has created a barrier to upstream steelhead migration, except possibly under extreme flood conditions. Under existing conditions anadromous trout (steelhead) cannot access 8,448 linear feet of upstream habitat, including the project area. Fish found above the barrier are, according to the CDFG, "essentially residualized steelhead and rainbow trout." Conversely, fish found below the barrier are probably all sea-run steelhead (CDFG, 1987). *Information on the downstream barrier to steelhead migration has been developed by Hydrocomp, Inc. (1988) (see Appendix B). A study of this information, as well as all fishery information collected by BFI and CDFG, was conducted by Thomas R. Payne & Associates (TRPA). The TRPA report concludes that the fishery occurring in the project area should be considered resident rainbow trout (Salmo gairdneri Richardson) (see Appendix B).*

Much of the Apanolio Creek aquatic habitat, including the stream segment within the project area, consists of shallow riffle-run areas, and to a lesser extent, pool habitats. Sandy substrates predominate in both the

riffle-run and pool habitats. Instream cover typically consists of tree roots, fallen trees, and undercut banks. The downstream perennial portions of Apanolio Creek generally receive extensive overhead shade cover from the alder canopy growing along the channel banks. Stream temperatures probably remain relatively cool (less than 60° to 70°F throughout the summer).

To characterize the aquatic invertebrate populations in Apanolio, Corinda Los Trancos, and Pilarcitos Creeks, an invertebrate study was conducted by Thomas R. Payne & Associates (TRPA). This study, presented in Appendix B, indicated that an adequate food base for trout existed at each of the sample sites. Therefore, a trout fishery could be supported by these streams provided other physical habitat requirements also existed.

c. Corinda Los Trancos Canyon

Within the affected reach of Corinda Los Trancos Creek and the several sedimentation basins associated with the existing landfill, aquatic biological resources appear to be limited to amphibians (e.g., Pacific tree frog and red-legged frog) and various aquatic invertebrates. Neither this reach of the creek, nor the sedimentation basins, appear to support fish populations. Downstream from the proposed forefill area, the creek may provide limited steelhead trout habitat (CDFG, 1987).

Within the proposed forefill area, the creek's aquatic habitat consists of shallow riffle-run areas, and to a lesser extent, shallow pools. Sandy substrates predominate in both the riffle-run and pool habitats. Similarly, the existing sedimentation basins provide pool habitats with silty/sandy substrates and seasonally warm, turbid water.

Both instream and overhead shade cover, in the form of willow trees and willow tree branches, are abundant below the sedimentation basins. Instream cover typically consists of willow tree roots and fallen trees. Extensive overhead shade cover is afforded by a variety of trees and shrubs growing along the channel banks. The abundance of streamside and instream vegetation (fallen, leaning trees) hampers, if not prevents, the movement of large animals through the stream channel.

Sandy erosive stream channel banks, combined with periodic high flow events, result in a relatively unstable stream channel morphology in Corinda Los Trancos Creek. Sandy sediments are readily deposited in potential pool habitats, or other areas where stream channel velocities are lower than the adjoining riffle-run stream segments.

d. Nuff Canyon

The aquatic biological resources of Nuff Creek and associated intermittent tributaries are not well documented. However, based on a recent field reconnaissance conducted by HLA (September 29, 1987), Nuff Creek and its associated tributaries appear to provide habitat for many of the same aquatic species found elsewhere in the Pilarcitos Creek Basin. Nuff Creek probably does not support resident fish populations, with the exception of the lower 2,640-linear-foot stream segment. Beginning at the Pilarcitos Creek confluence, the creek cannot support anadromous fish because of the presence of migration barriers and the limited availability of suitable microhabitats (CDFG, 1987).

Much of the Nuff Creek aquatic habitat consists of shallow riffle-run areas with sandy substrates. During the September field reconnaissance, HLA noted that less than 10 percent of the Nuff Creek stream channel was composed of pool habitats. Ninety percent of the creek area consisted of riffle-run habitats. At the time of the survey, Nuff Creek streamflows were less than 0.15 cfs (low flow condition). Water depths in the riffle-run areas were typically less than 1.5 inches, pools were typically 8 to 12 inches deep.

The near absence of pool habitats is at least partially attributable to the presence of sandy, erosive, stream banks, which appear to provide much of the total stream sediment load (versus hillside sheet, rill, and/or gully erosion) transported by Nuff Creek, upstream of the sediment traps. Stream channel sediments are readily deposited in potential pool habitats, or other areas where stream channel velocities are lower than the adjoining riffle-run stream segments.

In addition to restricting the formation of pool habitats, the abundance of sandy stream channel substrates appears to limit the species diversity of aquatic invertebrate populations. Typical Nuff Creek aquatic invertebrate species include flatworms and amphipods. Mayflies and stoneflies were present during HLA's field reconnaissance, but were not abundant, possibly due to the shortage of suitable cobble/gravel substrate habitats.

Much of the Nuff Creek stream channel receives extensive overhead shade cover from a variety of trees and shrubs growing along the channel banks. Stream temperatures probably remain relatively cool (less than 60° to 70°F)

throughout the summer. These relatively cool stream temperatures, in conjunction with the perennial stream flow, may provide suitable habitat for various salamander and newt species.

4.3.4 Sensitive Species

a. General

No federally or state listed or proposed threatened, endangered or rare species or other sensitive species have been recorded from the project vicinity. However, the potential occurrence within the Pilarcitos Creek basin of several plant and animal species of concern has been noted by various investigators (Thomas Reid Associates, 1984; U.S. Fish and Wildlife Service, July 7 and September 16, 1987). A list of those species and their current status is presented in Table 4.3-1.

A discussion of the occurrence or potential occurrence of each of these organisms or groups of organisms is presented below.

b. Marbled Murrelet

The marbled murrelet is a pelagic seabird that nests in old growth coniferous trees in close proximity to the ocean. Because the project area contains several stands of relatively old Douglas fir, the U.S. Fish and Wildlife Service (July 7, 1987) has expressed concern that the project could affect murrelet nesting habitat. A survey was conducted by biologists from the Point Reyes Bird Observatory on July 30, 1987 to determine if marbled murrelets were nesting in the project area and to assess potential murrelet habitat. No murrelets were observed and the resulting report, contained in Appendix B, concludes that Apanolio Canyon does not contain suitable nesting habitat for marbled murrelets.

Table 4.3-1. Sensitive Species Potentially Occurring Within Project Vicinity

<u>Common Name</u>	<u>Scientific Name</u>	<u>Status</u>
Marbled murrelet	<i>Brachyramphus marmoratus</i>	State special concern
San Francisco garter snake	<i>Thamnophis sirtalis tetratuena</i>	Federal endangered
San Francisco forked-tailed damselfly	<i>Ischnura gemina</i>	Federal Candidate/Category 2
Ricksecker's water scavenger beetle	<i>Hydrochara rickseckeri</i>	Federal Candidate/Category 2
Myrtle's silverspot butterfly	<i>Speyeria zerene myrtleae</i>	Federal Candidate/Category 2
Leech's skyline diving beetle	<i>Ehydroporus lecchi</i>	Federal Candidate/Category 2
San Mateo woolly-sunflower	<i>Eriophyllum latilobum</i>	Federal Candidate/Category 1
Marin dwarf-flax	<i>Hesperolinon congestum</i>	Federal Candidate/Category 1
White-rayed pentachaeta	<i>Pentachaeta bellidiflora</i>	Federal Candidate/Category 2
Dolores campion	<i>Silene verecunda ssp. verecunda</i>	Federal Candidate/Category 2
Coast lupine	<i>Lupine arboreus eximius</i>	Coastal endemic
	<i>L. latifolium dudleyi</i>	Coastal endemic
Tree lupine	<i>Lupinus arboreus aboreus</i>	Host plant tree lupine moth
Coast sedum	<i>Sedum spathulifolium</i>	Host plant - elfin butterfly

Category: 1 - Information sufficient for federal listing by USFWS.
 2 - Information insufficient for formal proposal for listing.

Source: Thomas Reid Associates, 1984; U.S. Fish and Wildlife Service
 July 7, 1987 and September 16, 1987.

c. San Francisco Garter Snake

Apanolio Canyon is about the center of the range for the endangered San Francisco garter snake. Large, quiet ponds with dense reed, cattail and willow cover around the shoreline provide ideal habitat for the species. Surveys conducted by Dr. Ted Papenfuss in 1983 and 1987 found no suitable habitat within the Apanolio Canyon project site but identified pond-type habitats downstream of the property line along the lower portions of Apanolio Creek (Thomas Reid Associates, 1984).

Another San Francisco garter snake study by Dr. Samuel M. McGinnis surveyed three tributaries of Pilarcitos Creek (Apanolio, Corinda Los Trancos and Nuff) to determine whether suitable habitat for the snake occurs in those drainages. No suitable habitat was observed along Nuff Creek during the mid-May 1987 reconnaissance but potentially suitable pond-type habitats were identified in Apanolio Creek south or downstream of the BFI property and in Corinda Los Trancos Canyon. A trapping program involving traplines at three sites--one along Apanolio Creek near the southern project boundary and two around ponds in Corinda Los Trancos--was begun in May 1987. *This 1987 study, ending in December 1987, completed a total of 8,008 trap days including 4,574 trap days at the Apanolio Creek site and 3,434 trap days at the two Corinda Los Trancos Canyon sites. Although no San Francisco garter snakes were trapped by this survey, the study demonstrated the presence of both the coast garter snake and the Santa Cruz garter snake. The drawback of this study was that the trapping period did not occur during the active spring period for the snake. To complete the*

survey, a second phase of the study was conducted between mid-March and mid-June of 1988. This trapping effort completed an additional 5,580 trap days including 4,320 trap days in Apanolio Canyon and 1,260 trap days in Corinda Los Trancos Canyon. As with the 1987 survey, no San Francisco garter snakes were captured or observed; however, the study traps captured 19 coast garter snakes and 5 Santa Cruz garter snakes. In the study report prepared by Dr. McGinnis (Appendix B) the conclusion states "... at present no San Francisco garter snakes exist in the study areas of Apanolio and Corinda Los Trancos Canyons."

In a letter from the Sacramento Endangered Species Office of the U.S. Fish and Wildlife Service to the San Francisco District of the Corps dated September 16, 1987, the Service provisionally excluded the San Francisco garter snake from its list of endangered species that may be present within the project area based on negative findings of survey work as of that date (Kobetich, September 16, 1987).

d. Invertebrates

In the USFWS letter referenced above (Kobetich, September 16, 1987), a list of four candidate species of insects that could potentially be proposed for listing was presented and the Service recommended that their status and potential occurrence within the project area be considered. In response to that recommendation, BFI secured the services of Dr. Richard A. Arnold who reviewed the available scientific literature, summarized the known geographic range and identified the habitat and ecological requirements of each taxon (see Appendix B). Through preliminary field reconnaissance, data

review, and consultation with other noted entomologists and USFWS personnel, Dr. Arnold concluded that two of the candidate insects (San Francisco forked-tail damselfly and Myrtle's silver spot butterfly) were not expected to occur within the project area. For the other two (Ricksecker's water scavenger beetle and Leech's skyline diving beetle), the limited biological information available indicates an association with pond type habitats which are not typical within the affected reaches of the Apanolio or Nuff Creek drainages, but do occur in Corinda Los Trancos.

e. Plants

The USFWS also identified four candidate plant taxa that should be considered relative to the proposed project (Kobetich, September 16, 1987). The San Mateo woolly sunflower (*Eriophyllum latilobum*) is a very restricted endemic species known from only two locations in San Mateo County and associated with mixed California live oak, buckeye and shrubs. The Marin dwarf flax (*Hesperolinon congestum*) is typically found in serpentine grassland and associated rock and shrub dominated habitats, and is known from several locations in northern coastal California including barren slopes along the east side of Crystal Springs Reservoir. Sufficient biological information is available for both of these species to support a proposal for listing as endangered or threatened. The white-rayed pentachaeta (*Pentachaeta bellidiflora*) grows on open, dry, rocky slopes in Marin, San Mateo, and Santa Cruz counties. The Dolores campion (*Silene verecunda ssp verecunda*) is generally found in sandy coastal habitats from San Francisco south to Santa Cruz county. There is not sufficient

biological information available for either of these taxa to support a listing proposal.

None of these taxa have been found in the Apanolio Canyon project area or in either of the alternative project locations under consideration. Because of their restricted ranges and habitat requirements, they are not expected to occur in the area.

Four plant taxa of concern were discussed in the previous EIR on the project (Thomas Reid Associates, 1984). Two San Mateo coastal endemic lupines known only from Montara Mountain northwest of the project area (*Lupinus arboreus* var. *eximus* and *L. latifolius* ssp *dudleyi*) were not found in the Apanolio Canyon project area during surveys conducted for that EIR. Neither of these taxa appear on federal or state lists nor is either listed in any of the four categories in the California Native Plant Society (CNPS) Inventory (CNPS, 1984). The possibility exists that either plant could be found in the unsurveyed areas of upper Apanolio Canyon or at the alternative project sites.

Two other plants, the common tree lupine (*Lupinus arboreus*) and the coast sedum (*Sedum spathulifolium*) were noted in the previous EIR because they are host plants for the tree lupine moth (*Grapholita edwardsiana*) and the San Bruno elfin butterfly (*Callophrys mossii bayensis*), respectively. Although tree lupines containing active tree lupine moth larvae were found by Dr. Arnold in the project area, the moth is now known to occur throughout a relatively large geographic range and the USFWS is in the process of downgrading its candidate status accordingly (Arnold, October 1987 - See

Appendix B). Coast sedum was not observed during botanical survey work for the previous EIR, nor was its typical habitat - north-facing rock outcrops - observed by Dr. Arnold during his site visit on September 22, 1987. Consequently, the San Bruno elfin butterfly is not expected to occur in the project area (Arnold, October 1987 - See Appendix B).

4.4 Transportation

a. Regional Highway Network

Several major roadways service San Mateo County. Primary north-south corridors are U.S. Highway 101, along the eastern side of the peninsula, Interstate 280 (I-280), connecting San Francisco with San Jose, and State Highway 1, a coastal highway on the western side of the peninsula. East-west routes include State Highway 92, connecting Foster City and the East Bay to Half Moon Bay at Highway 1, and Interstate 380 (I-380), a major connecting route between U.S. 101 and I-280 near San Bruno.

Highway 92 Characteristics

Width

Highway 92, the two-lane paved highway that provides access to the Ox Mountain Sanitary Landfill, varies in width from 26 feet to 40 feet. Between the landfill entrance and Crystal Springs Reservoir the roadway widens to nearly 40 feet in four locations. The 26-foot pavement sections include two 12-foot-wide travel lanes with 1-foot-wide shoulders (Thomas Reid Associates, 1986).

Eastbound portions of Highway 92 between the landfill entrance and Crystal Springs Reservoir have passing lanes (three-lane sections)

consisting of two short passing lanes, each approximately 800 to 900 feet in length, between Pilarcitos Creek Road and the Skyline Boulevard summit. In the westbound direction, between Crystal Springs Reservoir and the Skyline Boulevard summit, there are two road sections with 8-foot-wide shoulders.

Grade

The average road grade on the western side of the summit (between Pilarcitos Creek Road and the Skyline Boulevard summit) is 7 percent and the eastern side (between Skyline Boulevard and Crystal Springs Reservoir) has an average grade of 6.25 percent (Thomas Reid Associates, 1984).

Capacity

The capacity of Highway 92 between Pilarcitos Creek and Crystal Springs Reservoir is approximately 1,400 passenger car equivalent (pce) vehicles per hour in each direction (Thomas Reid Associates, 1984). The passenger car equivalent measure allows the additional impact of trucks, buses and recreational vehicles as compared to passenger cars to be accounted for in the amount of highway capacity required. The capacity of 1,400 pce per hour incorporates the roadway widths, grades, sight distances and passing lane opportunities on this highway. It should be noted that the maximum capacity of the road is not represented by a single number, but rather by a range that varies with specific characteristics such as traffic composition, weather conditions, driver skills and physical roadway conditions.

Methods of Measuring Traffic Conditions

Volume/Capacity Ratios

The quality of traffic service provided by a roadway system is measured in terms of the traffic volume versus the capacity of the system. The

service volume of traffic on a roadway divided by the design capacity of the roadway is called the volume to capacity (V/C) ratio. If the amount of traffic on a roadway is equal to its capacity, the V/C ratio would be 1.0.

Level of Service

The Level of Service (LOS) concept is a standard means of expressing the types of traffic conditions associated with various V/C ratios. There are six Levels of Service ranging from Level A through Level F reflecting peak period driving conditions from best to worst, respectively. The characteristics of traffic flow for these various levels are summarized in Table 4.4-1.

Existing Traffic Levels

Traffic counts for Highway 92 near the Highway 92/Route 35 intersection are presented in Table 4.4-2. The 1986 traffic volumes for Highway 92 near Route 35 are presented in Table 4.4-3.

Table 4.4-1. Level of Service Concept
Two-Lane, Two-Way Rural Highways

<u>Level of Service A</u>	Volume/Capacity Ratio = 0 - 0.14
<ul style="list-style-type: none"> - drivers free to choose desired speed - highway geometrics and/or traffic volumes do not significantly affect choice of speed - passing demand is less than passing capacity - vehicle platoon sizes limited to three vehicles - motorists delayed no more than 30 percent of the time by slower traffic - average speeds at or above 55 mph speed limit 	
<u>Level of Service B</u>	Volume/Capacity Ratio = 0.15 - 0.24
<ul style="list-style-type: none"> - significant amount of multi-vehicle platoons - average speeds at or above 50 mph - passing demand reaches passing capacity of highway - motorists are delayed 45 percent of the time by slower traffic 	
<u>Level of Service C</u>	Volume/Capacity Ratio = 0.25 - 0.39
<ul style="list-style-type: none"> - unrestricted passing demand exceeds passing capacity - "chaining" of platoons begins to appear - Traffic flow is stable but susceptible to congestion due to turning traffic and slow vehicles - motorists are delayed 60 percent of the time - average speeds exceed 52 mph 	
<u>Level of Service D</u>	Volume/Capacity Ratio = 0.40 - 0.59
<ul style="list-style-type: none"> - unrestricted passing demand is very high - passing capacity approaches zero - platoon sizes of 5-10 vehicles are frequent - turning vehicles or roadside distractions cause major shock waves in traffic stream - opposing traffic streams essentially operate as separate traffic streams - motorists are delayed up to 75 percent of the time - average speeds are about 50 mph 	
<u>Level of Service E</u>	Volume/Capacity Ratio = 0.60 - 1.00
<ul style="list-style-type: none"> - unstable operating conditions - motorists are delayed more than 75 percent of the time - travel speeds are between 45 and 50 mph for flat terrain, between 40 and 50 mph for rolling terrain, and between 30 and 35 mph for mountainous terrain 	

Table 4.4-1 (continued)

<u>Level of Service F</u>	Volume/Capacity Ratio = 1.00 or more
- forced flow conditions	
- low speeds	
- stoppages for long periods due to downstream congestion	
- flow may be zero	
- motorists are delayed 100 percent of the time	

Source: Transportation Research Board, 1985, Highway Capacity Manual, Special Report 209.

Table 4.4-2. Traffic Counts, Volume/Capacity Ratios and Levels of Service on Highway 92/Route 35 Intersection (weekday)

<u>Time of Day</u>	<u>Traffic Count¹</u>	<u>Volume/Capacity² Ratio</u>	<u>Level of Service</u>
<u>Eastbound</u>			
7 - 8 a.m.	1,535	1.10	F
11 a.m. - 12 noon	915	0.65	E
5 - 6 p.m.	644	0.46	D
<u>Westbound</u>			
7 - 8 a.m.	698	0.50	D
11 a.m. - 12 noon	898	0.64	E
5 - 6 p.m.	1,121	0.87	E

¹ Trucks (3-axle and larger and buses) were assumed to be equivalent to 20 passenger cars when loaded and 4 passenger cars when empty. A 50/50 loaded/empty ratio was assumed in calculation.

² Capacity = 1,400 pce (passenger car equivalents) per hour

Source: Caltrans District 4, 1987. Vehicle count, Highway 92/Route 35 Intersection. September 2, 1987.

Table 4.4-3. Highway 92 Traffic Volumes for 1986

Peak Hour	3,300
Peak Month ADT ¹	19,800
Annual ADT ¹	16,500

¹ ADT - Average Daily Traffic

Source: Caltrans, 1986 Traffic Volumes on California State Highways.

Highway 92 traffic volumes for both eastbound and westbound lanes are presented in Table 4.4-2 for three time periods: the weekday morning peak hour (7:00 a.m. - 8:00 a.m.), weekday midday period (11:00 a.m. - 12:00 noon), and weekday evening peak hour (5:00 p.m. - 6:00 p.m.).

Also presented in Table 4.4-2 are V/C ratios and LOSs for each of the time periods. The data indicate that eastbound volumes on weekday mornings exceed the design capacity of the roadway. During the 7:00 a.m. - 8:00 a.m. commute peak period, the volume/capacity ratio is 1.10, resulting in LOS F conditions (see Table 4.4-1). Eastbound traffic volumes at other measured time periods are below roadway design capacity, and LOS ranges from D to E. Westbound traffic volumes were below the roadway capacity for all periods measured. The p.m. peak hour volume westbound approached capacity resulting in LOS E operation. Westbound LOS at other time periods ranges from D to E.

Planned Roadway Improvements

Several Highway 92 improvements have been proposed by Caltrans to the California Transportation Commission for funding. These improvements were listed in the five-year State Transportation Improvement Program (STIP) for 1986.

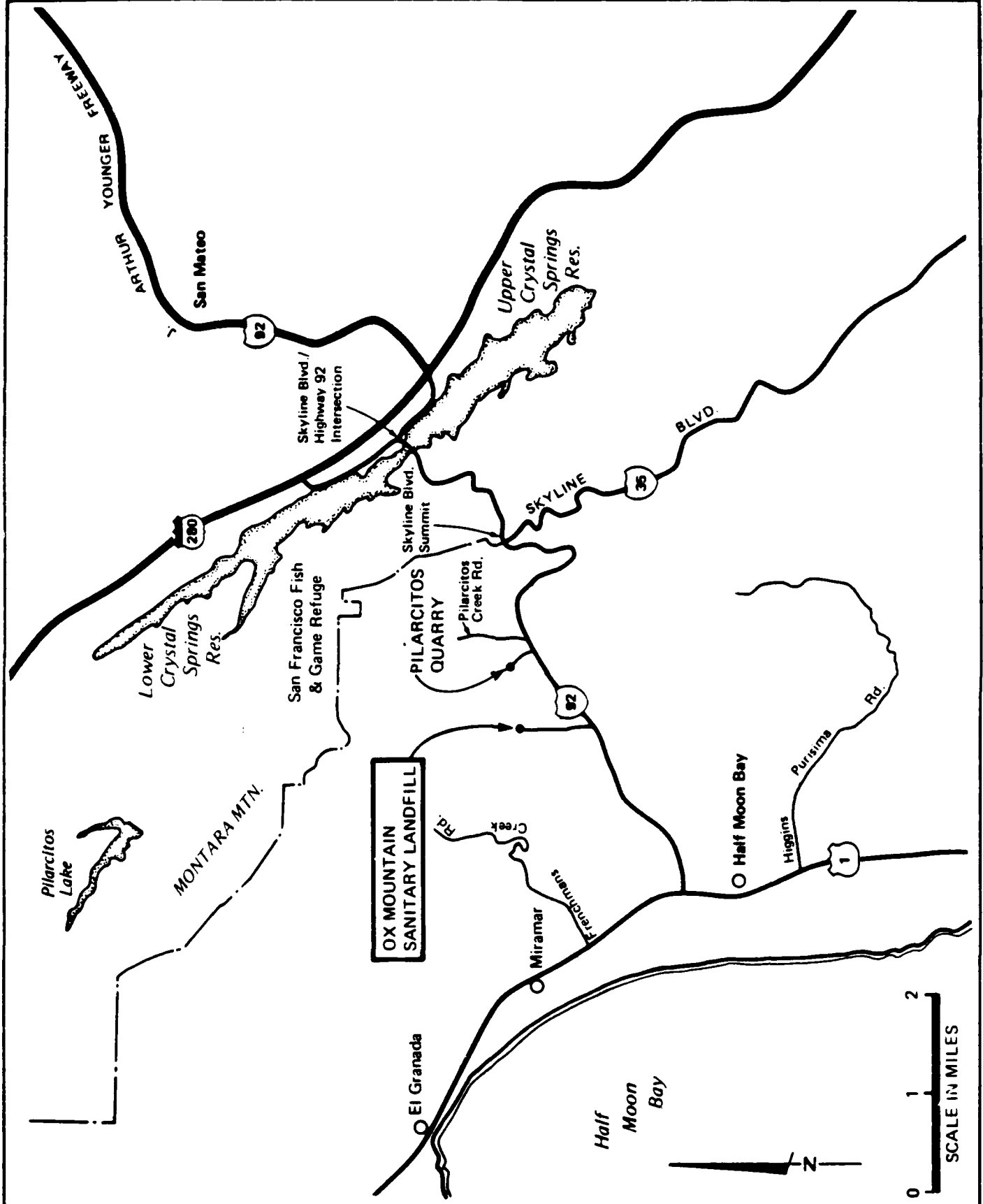
Continuous uphill and downhill slow vehicle lanes between Pilarcitos Creek and the Skyline Boulevard summit have been scheduled for construction beginning in 1993. One alternative under consideration would modify the roadway to include two 12-foot lanes and one 10-foot paved shoulder. A 10- to 12-foot median/barrier would also be constructed to separate east and westbound traffic lanes (Knickelbein, pers. com., December 18, 1987). Other improvements being considered include a passing lane in the westbound direction between I-280 and the summit, and several spot improvements, such as left turn lanes and deceleration lanes for improved access to businesses along Highway 92 east of Half Moon Bay (Thomas Reid Associates, 1984).

b. Ox Mountain Sanitary Landfill

Site Access

The Ox Mountain Sanitary Landfill is reached via State Highway 92. This route connects the landfill entrance with Highway 1, approximately 2 miles to the west, and I-280 and U.S. 101 to the east, approximately 7 and 12 miles, respectively, as shown in Figure 4.4-1. Landfill access from Highway 92 is provided by a two-lane paved roadway located in the central portion of Corinda Los Trancos Canyon. This paved access route terminates near the upper portion of the active landfill where a two-lane gravel road extends to the working face of the landfill.

Transfer station hauls originate at four locations in San Mateo County: Daly City, San Bruno, South San Francisco, and San Carlos. The most common routes to the landfill are the primary arterials in the northern peninsula, Highway 1, U.S. 101, and I-280.



HLA Harding Lawson Associates
Engineers and Geoscientists

Major Highways, Project Area
Ox Mountain Sanitary Landfill
Apanolio Canyon Expansion Site EIS
San Mateo County, California

FIGURE

4.4-1

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
CSN	6234,031.01		11/87		

Existing Traffic to Ox Mountain Facility

Private vehicle traffic to the landfill is approximately 120 vehicles per day. Of these vehicles, it is estimated that 70 trips originate from points west of the landfill, traveling eastbound on Highway 92 from Half Moon Bay. The remaining 50 vehicles per day come to the facility from east of the Coast Range.

An estimated 90 transfer truck round trips are currently made over the summit of Highway 92 from the Bayside of the Coast Range to the Ox Mountain Sanitary Landfill each weekday (Sargent, pers. com., October 5, 1987). These transfer trucks are five-axle semi-tractor trailer vehicles approximately 60 feet in length and carry refuse from the various transfer stations to the landfill. They are high capacity vehicles capable of carrying four to five times the volume of individual collection trucks. Thus each of these transfer vehicles consolidates four or five collection vehicle trips into a single transfer truck trip to the landfill site. The existing facility also services approximately 10 transfer truck trips each day from the west of the landfill entrance.

Traffic Restrictions

The use permit issued for operation of the Ox Mountain Sanitary Landfill prohibits refuse and dirt haul trucks from leaving the facility in the eastbound direction between 7:00 a.m. - 8:30 a.m. However, during 8:00 a.m. - 8:30 a.m., unloaded transfer trucks may depart in the eastbound direction at intervals of at least two minutes. No westbound access to the landfill site is permitted between 4:00 p.m. - 6:30 p.m. On Saturdays, Sundays, and

Holidays, transfer truck access is restricted to the hours of 7:00 a.m. - 10:00 a.m. No public access is allowed on Sundays or Holidays.

Traffic Delays

Highway 92 is the major route connecting the Half Moon Bay area to eastern portions of San Mateo County. For this reason, traffic is often heavy and traffic delays commonly occur. High volume truck traffic is often the cause of delays due to steep grades, and narrow roadway widths along Highway 92. Among the sources of truck traffic along Highway 92 are the Ox Mountain Sanitary Landfill and Pilarcitos Quarry located in Nuff Canyon (east of Corinda Los Trancos Canyon). Queues up to 100 vehicles in length have been observed following fully loaded eastbound gravel trucks during the morning peak hour. Midday truck delays are not nearly as severe, but are probably more frequent due to a higher volume of truck traffic during midday (Thomas Reid Associates, 1986).

Ox Mountain Truck Traffic

Fully loaded westbound transfer trucks were observed to require approximately three minutes more than passenger car vehicles to travel from the Skyline Boulevard/Ralston Avenue intersection to the Ox Mountain access road. The average speed of the transfer trucks is approximately 28 miles per hour over this 5.4-mile distance, compared to approximately 39 miles per hour for passenger cars. Transfer trucks typically maintain a speed of 20 miles per hour up the steepest portions of the grade between Crystal Springs Reservoir and the Skyline Boulevard summit. On the downhill portion

of the highway west of the summit, transfer trucks travel at about 40 to 50 miles per hour (Thomas Reid Associates, 1984).

In the eastbound direction, empty transfer trucks require approximately one minute of travel time more than do passenger cars from the Ox Mountain access road to the Skyline Boulevard/Ralston Avenue intersection. The average transfer truck speed over this segment is approximately 36 miles per hour compared to 40 miles per hour for passenger cars. The empty transfer trucks are typically able to travel at speeds between 30 and 40 miles per hour up the steepest portions of the grade between Pilarcitos Creek Road and the Skyline Boulevard summit, depending on the individual vehicle. Transfer truck drivers were observed to utilize all paved shoulders and passing lanes on either side of the summit to the fullest extent possible to allow other vehicles to pass. However, truck drivers seldom come to a full stop on uphill grade turnouts to allow other vehicles to pass, probably due to the difficulty in regaining uphill momentum after a full stop (Thomas Reid Associates, 1984).

c. Nuff Canyon

Canyon Access

Access to Nuff Canyon is via a truck access road extending from Highway 92 approximately 0.5 mile into Nuff Canyon to the operating Pilarcitos Quarry site. This access road is paved for approximately 100 feet from its intersection with Highway 92, and then continues to the quarry as a two-lane gravel road. Truck traffic is controlled by a stop sign at the access road intersection with Highway 92 (Martin Carpenter

Associates, 1985). An unimproved road extends from the quarry site into the northern portion of Nuff Canyon.

Quarry Truck Traffic

The quarry operation, because demand for fill material fluctuates annually with the construction season, has a peak operating period of March through October. During this peak season, an average of 83 loaded trucks exit the quarry on a daily basis. The annual average daily truck traffic from the site is approximately 73 loaded trucks (Martin Carpenter Associates, 1987). Traffic restrictions contained in the quarry operating permit vary the frequency of trucks leaving the quarry from one truck every 2 minutes to one truck every 4 minutes during the construction season. An estimated 80 percent of the loaded trucks leaving the quarry are eastbound on Highway 92 (PRC Engineering, 1985). Trucks traveling westbound on Highway 92 toward the quarry, over Skyline summit, are generally empty, and have limited impact on traffic flow.

4.5 Air Quality

Climate

Data from Montara Point, north of Half Moon Bay, and Pigeon Point, south of Half Moon Bay, indicate that the prevailing winds in the area are from the northwest. However, winds in project area are largely affected by the morphology of the western side of the coastal range with its numerous ridges and canyons. Local wind patterns within Apanolio Canyon and adjacent canyons are generally up-canyon in the morning and down-canyon in the

afternoon. Temperature inversions sometimes occur in late summer or early fall causing this wind condition to be reversed (down-canyon in the morning and up-canyon in the afternoon). Fog can occur in the lower portions of the canyon during these inversion conditions (Thomas Reid Associates, 1984).

Existing Air Quality

Air quality data is not available for the immediate project area and no coastal monitoring stations currently exist in the area. However, carbon monoxide (CO) data is available from a Caltrans monitoring station in Half Moon Bay. Data for June through October of 1973, shows an average daily CO level of 1 to 2 parts per million (ppm). CO levels reached 3 to 7.5 ppm for nine of these days, four of which were in October, when inversion conditions often occur (Thomas Reid Associates, 1984).

Temperature inversions frequently occur in the project area during late summer and early fall. During these periods, concentration of vehicle emissions could occur locally along Highway 92 due to stagnant air conditions associated with these inversions. However, there is currently no data to indicate an air quality problem in the area (Thomas Reid Associates, 1984).

Landfill Emissions

The project site is within the Bay Area Air Quality Management District (BAAQMD). The existing Corinda Los Trancos Canyon landfill has had a good record with respect to odor and dust emissions. The closest residences to the landfill are located in Apanolio Canyon and near the intersection of the existing landfill access road with Highway 92. Complaints from these and

other residents regarding emissions from the landfill have not been a problem (Lew, pers. com., October 16, 1987).

Landfill construction and operation activities can generate odors, fugitive dust (particulates), and vehicle exhaust emissions. Odors are caused by gases generated from the decomposition of waste and from refuse leachate. Fugitive dust is generated by earthmoving equipment during landfill construction. During landfill operation, vehicles accessing the landfill and equipment used to move, compact, and cover the refuse also generate dust. Dust generation is generally greatest during summer and early fall when soil moisture is low and windy conditions occur. Motor vehicle exhaust emissions are associated with landfill activities. The source of these emissions include refuse transfer trucks, private vehicles hauling refuse to the site, and refuse handling equipment at the site.

Typically, the majority of the gas generated by landfills consists of methane, carbon dioxide, hydrogen, and nitrogen; none of which are considered air pollutants. Smaller amounts of other gases are also produced that are considered pollutants such as hydrogen sulfide, sulfides, and non-methane hydrocarbons. The BAAQMD considers landfills a major source of hydrocarbon emissions (Torrey & Torrey, Inc., 1983). The rate at which landfill gases are generated is determined by such factors as composition of the waste, temperature, moisture content, density, and particle size (Dewalle et al., 1978).

Methane gas poses a risk of fire or explosion. However, the amount of oxygen available in landfills is not sufficient to allow explosive

combustion (Dewalle et al., 1978). BAAQMD Regulation 8, Rule 34 requires methane recovery systems be implemented at all landfills containing in excess of 1 million tons of waste. A methane recovery system is currently in place and operational at the Corinda Los Trancos Canyon landfill.

Sensitive Receptors

Several residences and small agriculture operations are located in southern Apanolio Canyon. The only other residences or businesses close to the project site are near the intersection of the landfill access road and Highway 92. Other receptors include landfill employees and vehicle operators delivering refuse to the site.

4.6 Noise

Methods of Measuring Noise

Noise in the everyday environment ranges greatly in magnitude and frequency. Because of the large energy range of common noises, noise is most commonly expressed using a logarithmic scale known as the decibel (dB). Using this scale, noise levels in everyday life typically range from 30 to 90 dB. Every 10 dB increase would be a change in perceived noise level by the listener of twice of the reference noise level.

The human ear is more sensitive to high-frequency sounds than to lower or middle frequency sounds. An adjustment of noise measurements to more adequately evaluate human perceptions or response to noise exposures is often used. This adjustment is referred to as an A-weighted decibel (dBA).

To define the daily noise environment, a common indicator is an average of noise exposure over a 24-hour period. This value, called the community noise equivalent level (CNEL), is adjusted to account for the increasing sensitivity of people to noises during evening and night periods.

Other methods of characterizing the noise environment is to approximate the ambient or background noise level and the equivalent continuous noise level (L_{eq}). Noise levels are often expressed in decibels that are exceeded a certain percentage of time; the symbol for this percentage is L_x , where L_x is the noise level exceeded x percent of the time. L_{50} , the noise level exceeded 50 percent of the time, is the median noise level. L_{90} (the noise level exceeded 90 percent of the time), in some cases, is a good indication of the ambient noise level, or the background noise level.

a. Existing Noise Levels

Noise Sources

The principal noise source in the proposed project vicinity is vehicle noise along local roadways. Motor vehicle (both gasoline- and diesel-powered automobiles and trucks) traffic on Highway 92, the major access to the proposed project area, is the primary source of noise in the project vicinity. The noise emitted by larger trucks is greater than that emitted by typical passenger automobiles, however, the magnitude of automobile traffic along this route is much greater than truck traffic. Therefore, the automobile traffic dominates the community noise exposure along the roadway (Thomas Reid Associates, 1984).

Traffic Noise

The existing noise levels along the Highway 92 corridor vary considerably throughout the day and night. Traffic and especially trucks are the primary source of noise intrusion and therefore, noise levels fluctuate with the daily traffic flow. Peak heavy truck noise measured at 50 feet from the Highway 92 centerline was found to range from 80 to 85 dBA and peak automobile noise ranged from 70 to 75 dBA (Thomas Reid Associates, 1986). Transfer trucks en route to and from the Ox Mountain Sanitary Landfill generally paralleled other heavy truck noise emissions. Traffic noise measurements were taken at the intersection of Pilarcitos Quarry Road and Highway 92. These data (for early morning hours) are presented in Table 4.6-1.

The use of compression "jake" braking by transfer trucks generated noise levels in excess of 95 dBA at 50 feet. Noise emission from a Browning-Ferris Industries transfer truck westbound on Highway 92 was measured at the Pilarcitos Quarry Road location. A 33-second pass-by noise measurement was taken while no other traffic or intrusive noise was present. The L_{eq} for the pass was 73.4 dBA with a maximum noise level of 86.3 dBA (Thomas Reid Associates, 1986).

Early morning commute traffic noise was measured for 30 minutes between 6:00 am and 6:30 am. The L_{eq} was measured at 74.3 dBA, the L_{90} was 53.3 dBA and the maximum observed noise level was 92.3 dBA. These data indicate that the Highway 92 corridor is heavily noise impacted during the daytime commute periods. Noise levels measured in the early morning between 3:35 am

and 4:00 am indicated an L_{eq} of 60.1 dBA and an L_{90} of 29.8 dBA. These lower noise levels in the early morning hours increase with time as the commute and truck traffic increase during the daytime.

Table 4.6-1. Early Morning Traffic Noise Measurements at Highway 92 and Pilarcitos Quarry Road Intersection

Noise Measure	3:35 - 4:00 a.m.	4:05 - 4:39 a.m.	4:45 - 5:15 a.m.	6:00 - 6:30 a.m.
L_{eq}	60.1	62.4	65.4	74.3
L_{max}	82.3	86.3	86.3	92.3
L_{50}	34.8	39.0	46.8	69.8
L_{90}	29.8	31.0	36.0	53.3
# cars	11	28	60	272
# trucks (non-refuse)	2	1	1	13
# refuse trucks	1	5	9	18

Source: Thomas Reid Associates, 1986.

b. Existing Landfill Operations - Corinda Los Trancos Canyon

Landfill Operation Noise

Noise generated at the Ox Mountain Sanitary Landfill includes traffic noise generated by trucks and other vehicles traveling along the access road from Highway 92 to the working face of the landfill and equipment used in landfill operation. Equipment typically used at the landfill site consists of bulldozers that move, compact and cover solid wastes and vehicles hauling

cover material. Noise measurements (at 250 feet) taken during operation of a bulldozer at the site indicated that noise levels fluctuated from 66 to 79 dBA, with noise levels commonly between 72 and 74 dBA (Thomas Reid Associates, 1984).

Sensitive Receptors

In the immediate vicinity of the Corinda Los Trancos Canyon landfill there are few receptors. Potential receptors are generally located away from the current and proposed landfill operations near Highway 92 with the exception of landfill employees and vehicle operators. Apanolio Canyon is sparsely populated with only four residences and one commercial flower-growing operation in the canyon. There are several residences along Highway 92 in the vicinity of the access road leading to the Corinda Los Trancos Canyon landfill.

Noise levels were measured at the single family residence in Apanolio Canyon closest to the landfill site. Noise levels from trucks operating on the landfill haul route were measured between 38 and 45 dBA at this residence. Backup safety beepers from bulldozers operating on the landfill were barely perceptible (Thomas Reid Associates, 1986).

c. Nuff Canyon Quarry Operation

Noise generated at the quarry site includes traffic noise generated by trucks traveling along the access road from Highway 92 to the quarry, equipment used to quarry the rock (e.g., bulldozers, front-end loaders, etc.) and rock processing equipment (e.g., rock crushers, conveyors, etc.). No blasting is currently used in mining operations (Martin

Carpenter Associates, 1985). These noises are generated within the immediate vicinity of the quarry, which is located approximately 2,500 to 3,000 feet north of Highway 92. No sensitive receptors are present in the canyon. The only areas that would be considered sensitive to noise impacts from these operations would be residences and commercial operations along Highway 92 in the vicinity of the quarry access road.

Noise measurements were taken for several quarry operations including measurement of emissions from truck traffic on the quarry access road, equipment used to mine the rock resource, and rock processing equipment. Results of these noise measurements are contained in Table 4.6-2.

Table 4.6-2. Noise Levels Generated During Quarry Operation

<u>Source</u>	<u>Maximum dBA (@ 100 feet)</u>
Truck	77
Mining Equipment	80
Processing Equipment	84

Source: Martin Carpenter Associates, 1985. Reclamation Plan for the Piombo Corporation, Pilarcitos Quarry, San Mateo County, California.

Using a sound attenuation factor of 6 dB per doubling of distance, the noise emissions generated by processing equipment at the quarry site would be approximately 50 to 55 dB at the intersection of the access road with Highway 92. Truck traffic noise thus has a greater impact on receptors near the Highway 92 intersection than do quarry operations. Intermittent noise emissions from quarry trucks and other equipment are limited to daylight hours.

4.7 Public Health and Safety

Solid waste disposal involves many activities that could affect the health and safety of the public. The following section is a discussion of the regulatory framework in San Mateo County, as well as several environmental areas often affected by solid waste facilities, including landfill gases, fugitive dust, vectors, fire, traffic, and security.

Regulations

Several state and federal agencies have direct or indirect involvement in the management of solid waste (San Mateo County, 1984) as discussed in Chapter 2.0.

Under the provisions of the Nejedly-Z'berg-Dills Solid Waste Management and Resource Recovery Act of 1972, local government is assigned the primary responsibility to provide adequate solid waste management and planning (San Mateo County, 1984). In San Mateo County, these responsibilities are delegated to the County Public Works Department, Planning Department, and Office of Environmental Health. The County Department of Public Works is responsible for the County Solid Waste Management Plan, the County Planning Department issues the Land Use Permits for landfill facilities, and the County Office of Environmental Health is responsible for monitoring and enforcement of permit conditions dealing with the sanitary operation of the landfill.

San Mateo County prepared a county-wide Solid Waste Management Plan which was adopted by the California Waste Management Board in 1977. The plan was revised in 1984 to provide a comprehensive document which addresses

all solid wastes produced or disposed of in the County. This revision was developed to meet the requirements of the California Waste Management Board and the needs of the County (San Mateo County, 1984).

Landfill Gases

The decomposition of solid waste generates a variety of gases and associated odors (also see Section 4.5; Air Quality). These gases consist primarily of methane, carbon dioxide, and hydrogen (Dewalle et al., 1978). Other gases such as argon, hydrogen sulfide, and non-methane hydrocarbons are also produced (Torrey & Torrey, Inc., 1983). The rate at which these gases are generated is dependent on such factors as composition of the waste, temperature, moisture content, density, and particle size (Dewalle et al., 1978).

The presence of methane creates a risk of explosion or fire. However, the amount of oxygen available within landfills is not sufficient to allow explosive combustion (Dewalle et al., 1978). The Bay Area Air Quality Management District (BAAQMD) considers landfills a major source of hydrocarbon emissions (Torrey & Torrey, Inc., 1983). According to BAAQMD Regulation 8, Rule 34 pertaining to organic emissions from landfills, methane recovery systems must be implemented on landfills in excess of 1 million tons of waste.

Dust Generation

Fugitive dust is generated at landfills by landfill construction activities, vehicles hauling refuse to the site, equipment used to handle

refuse, and during placement of soil cover. Dust generation is discussed under Air Quality, Section 4.5.

Vectors

Vectors are insects, rodents, or other animals that are capable of carrying and transmitting diseases or that may otherwise pose a nuisance to the public. Landfills attract flies, mosquitos, rodents, and birds, as well as other wild and domestic animals. These pests, or vectors, may carry diseases such as bacillary dysentery, salmonellosis, encephalitis, malaria, yellow fever, enteric and other infections (Torrey & Torrey, Inc., 1983).

The San Mateo County Office of Environmental Health is responsible for inspection and enforcement of vector control at County landfills. The Corinda Los Trancos Canyon landfill has a *good* record with respect to vector control (Lew, pers. com., October, 1987). The landfill has recently been placed on performance standards. Under these conditions, the landfill operators do not have to cover the refuse daily unless a vector problem develops. The Office of Environmental Health traps for rats and conducts fly counts on a monthly basis. If these tests reveal a vector problem, the landfill owner will be required to take steps to control the pests. Presently, compacting of refuse at the landfill is sufficient to reduce available habitats and thereby control the vector populations (Lew, pers. com., October, 1987).

Populations of mosquitos attracted to the landfill may potentially create a nuisance or health hazard. However, mosquitos have not been a problem at the Ox Mountain Sanitary Landfill.

Fires

The Corinda Los Trancos Canyon Landfill is within the boundaries of the Half Moon Bay Fire Protection District for structural fires. The Main Street station at Half Moon Bay would have first response for structural fires. Under a mutual aid agreement with the district, the California Department of Forestry and Fire Protection (CDFFP) would also respond from their station in Belmont, about 15 to 20 minutes from the site.

The proposed Apanolio Canyon expansion site is outside the jurisdiction of the Half Moon Bay Fire Protection District. Fires in the northern portion of Apanolio Canyon would be the responsibility of the CDFFP. Helicopters with water buckets are located at the Alma Station on Highway 17 and air tankers are 18 to 20 minutes away in Santa Rosa or Hollister (Thomas Reid Associates, 1984).

Threat of fire exists at the existing landfill from spontaneous combustion of refuse, disposal of smoldering material delivered for disposal, or ignition of refuse from the use of landfill equipment. In accordance with regulations of the BAAQMD, San Mateo County, and Half Moon Bay Fire Protection District, burning of refuse at the landfill is not permitted (Thomas Reid Associates, 1984).

Truck Traffic

Access to the project site is via State Highway 92. The intersection of Highway 92 and the Ox Mountain Sanitary Landfill entrance is controlled by a stop sign for vehicles traveling the landfill access road. Each weekday, approximately 90 truck trips are made over the Highway 92 summit from the

east by high capacity trucks hauling refuse from the transfer stations to the landfill (see Transportation, Section 4.4). These trucks are generally semi tractor trailer units approximately 60 feet in length.

Currently, there is traffic congestion on Highway 92 during peak commute hours. The traffic volume/capacity ratio during the weekday morning peak hour (7:00 - 8:00 a.m.) is currently 0.93. Loaded truck traffic often causes delays due to steep, narrow roadways and the resulting slower truck speeds. Loaded transfer trucks traveling west on Highway 92 from Skyline Boulevard to the landfill entrance generally require 40 percent more time to travel this distance than passenger car vehicles (see Transportation, Section 4.4).

Site Security

The project poses a potential for refuse contact by humans and wild or domestic animals. Access to the existing Ox Mountain Sanitary Landfill is through a guarded gate located on the landfill access road, near its intersection with Highway 92. The gate is manned during regular operating hours of the landfill and is closed and locked at all other times. BFI also employs a caretaker that occupies a residence near the landfill entrance.

4.8 Public Facilities and Services

The three alternative project sites (i.e., Apanolio, Corinda Los Trancos, and Nuff Canyons) are located in unincorporated San Mateo County. The demand for regular urban services, including fire and police protection, is relatively low in these areas.

Police protection is provided by the San Mateo County Sheriff's Department; however, both Corinda Los Trancos Canyon Landfill and Pilarcitos Quarry normally place little demand on police services. Response time to the project area ranges from 1 to 10 minutes, depending upon the nature of the call (Eagen, pers. com., October 14, 1987).

The Corinda Los Trancos Canyon Landfill and the Pilarcitos Quarry belong to the Half Moon Bay Fire Protection District (FPD), which maintains a cooperative agreement with the California Department of Forestry and Fire Protection (CDFFP). Fire protection services for the Apanolio and Nuff Canyon sites are administered solely by the CDFFP. Structural fires at the existing landfill would be responded to by the Half Moon Bay FPD from their station, approximately 2-1/2 miles south of the facility, in the City of Half Moon Bay. The nearest CDFFP office is located in Belmont, at the junction of State Highway 92 and Highway I-280, approximately 15 to 20 minutes from the project area (Thomas Reid Associates, 1984).

A major fire has not occurred in the Pilarcitos Creek watershed since 1929 and the existing fuel load in this area is considered to be very high.

4.9 Cultural Resources

The following discussion summarizes the cultural resources assessment of the project region, including findings from the research study conducted by Peter Banks of California Archaeological Consultants, Inc. (Thomas Reid Associates, 1984).

a. Regional

Prehistoric Period

Research of the archaeological site records and maps concludes that only one prehistoric site, CA-SMC-81, has been recorded in the project vicinity. Since this region would appear attractive for prehistoric habitation, the low number of recorded prehistoric sites can possibly be attributed to limited archaeological study of this area.

Circa 1769, the Half Moon Bay region was occupied by the Ohlone people, a term which more accurately describes the language rather than the tribe itself. The Ohlonean family was further broken down into eight distinct languages, including Ramaytush, utilized by Indians of both San Mateo and San Francisco Counties. The range of this linguistic group once extended from the Carquinez Strait through the San Francisco Bay, reaching south to Monterey Bay.

Historic Period

Mission Dolores, established in 1776 in San Francisco, initiated horse and ox ranching operations in about the 1790s, marking the first historical utilization of the Half Moon Bay region.

Upon converting the missions to secular uses around 1820, the Half Moon Bay area was granted to Spanish-American citizens. This grant, known as the Rancho de Tierra, was divided into two geographical areas; the boundary line being at the Arroyo de en Medio (creek in the middle) southeast of El Granada. The southern portion of land was granted in 1839 to Tiburcio Vasquez, who settled with his family on the north banks of Pilarcitos Creek

now the City of Half Moon Bay. The Rancho de Tierra also encompassed land currently considered the project location.

Across Pilarcitos Creek from Vasquez, Candelario Miramontes, the grantee of the Rancho Miramontes, resided with his large family. The village of San Benito, referred to as "Spanishtown" by Anglo-American immigrants to the area, became established by both the Vasquez and Candelario families. Later, in the 1840s and 1850s, San Benito was settled by Spanish-speaking emigrants from Chile and Mexico, as well as Californios.

The middle and late 1800s also brought immigrants of European descent to the area. In the 1870s and 80s, Portugese families cultivated grain and potatoes in the area, followed by Italian settlers who planted fruit, vegetable, and flower crops.

Although logging was an important industry in San Mateo County, there is no evidence in researched library materials or in the field that represents its historical occurrence in the project area.

b. Apanolio Canyon

In 1858, Apanolio Rodriguez, established his residence at the mouth of Digges Canyon (so named by the USGS map), referred to as Apanolio Canyon in this report. Canada de Apanolio, the creek originating from this canyon, was improperly designated Apanolio Creek on the Spring Valley Water Company maps in the 1870s. Later on around 1880-90, the same creek was called Fillmore Creek, after a local rancher.

In 1866, an Irishman named Robert Montgomery Digges settled in Apanolio Canyon. The historical presence of logging operations in the County was

previously indicated; however, neither Bob Digges (a descendant of Robert) nor Mr. Berta (area farmer since the 1920s) recall any such activity present in the canyon.

Other findings suggest that these structures may have pertained to water conduits constructed by the Spring Valley Water Company in the 1870s to export water from Lock's Creek through Apanolio Canyon, and ultimately to Crystal Springs Reservoir. Visible iron pipe remains were observed in the project area; however, there was no evidence of past structures.

Data Search and Field Investigation

Existing archaeological site records and maps on file at the Northwest Information Center of the California Archaeological Inventory were reviewed to determine the location of known cultural resources within or immediately surrounding the project site. No cultural resources were identified within the project area, while one prehistoric site and one historic site were located within 1/2 mile of the project area.

The field investigation that followed the document search consisted of examining, on foot, the primary and secondary terraces and stream bottoms of the canyon, often using trowels to clear vegetation and uncover surface soils.

Cultural Features

In the Half Moon Bay region, prehistoric human activities may be represented by the following evidence: darkened soil (midden) formed as a result of prolonged human habitation; shells of various molluscan species; implements or waste of obsidian, chert, or basalt; mortars, pestles, and

charmstones; burned and heat-fractured rock; burned and broken animal/bird bone; and human bone fragments.

Historic relevance may be characterized by: hand-blown or purpled glass fragments and/or fragmented ceramics; metal deposits (especially square nails); and structural remains, including foundations.

The absence of any significant cultural resources in the project area may be attributed to more desirable nearby spots for prehistoric habitation, with utilization limited to hunting and gathering forays. Similarly, any historic presence was probably restricted to brief activities such as water-conduit construction.

c. Corinda Los Trancos Canyon

This section summarizes the cultural resource assessment of Corinda Los Trancos Canyon recently performed by Archaeological Resource Service (ARS).

Data Search and Field Investigation

A literature check conducted in September 1987 by the Northwest Information Center indicates that no prehistoric or historic cultural resources have been recorded within the forefill area or in the immediate vicinity.

A surface reconnaissance of the project area included examining, on foot, the entire valley floor from the base of the present fill down to the lowest area planned for landfill expansion. A hand trowel was used to remove small divots of vegetation and to examine the underlying soil. The surface soils appeared to be almost uniform yellowish-buff-colored, loose sandy loam. The walls of the lower slopes of the canyon were visually

inspected for indications of rock outcroppings, terraces, springs, or other features which would have potentially attracted prehistoric or historic era occupants. However, none of these features was discovered.

No indication of buried cultural deposits was observed during surface inspection of the banks of the Corinda Los Trancos Creek drainage. Although this does not preclude the possibility of buried deposits in suitable locations, it reduces the likelihood of such deposits being present in the project area.

ARS reports that the possibility of buried Mid to Early Holocene archaeological deposits below the quaternary alluvium and colluvium is highly unlikely; however, such deposits have been encountered under similar conditions.

The field investigation revealed no potentially significant prehistoric or historic cultural resources in this area. As indicated earlier, the area may have been utilized for water or for refuge by Indians; however, no visible trace or archaeological site referring to such activities remains.

d. Nuff Canyon

A literature review conducted in September 1987 by the Northwest Information Center indicates that no prehistoric or historic cultural resources have been recorded within Nuff Canyon.

A field reconnaissance of the proposed landfill area in Nuff Canyon was not conducted. Approval of site access for the purpose of conducting a surface survey was not provided by the property owners.

Based on literature and field survey findings for Apanolio and Corinda Los Trancos Canyons, the prehistoric and historic uses of Nuff Canyon are probably similar to these two canyons.

4.10 Aesthetics

a. Regional

San Mateo County is located in the southern peninsula of the San Francisco Bay bounded by San Francisco County to the north and Santa Clara and Santa Cruz Counties to the south. The western perimeter of the county contains 56 miles of ocean coastline, and for the most part, remains unaffected by urbanization. The heavily forested Santa Cruz Mountain Range featuring several steep-sided canyons, separates the natural open coastal lands from the densely incorporated bay side to the east.

Because of its diverse aesthetic attributes, the landscape of the coastal slope region is of significant value in the county local coastal plan. State Highway 92 (designated a county scenic corridor), forms the southernmost boundary of the Ox Mountain Ranch, and provides a variety of scenic opportunities between Half Moon Bay to the west and the Junipero Serra Freeway (I-280) to the east. Agricultural operations, Christmas tree farms, and livestock are visible from this route as it winds through the coastal foothills (San Mateo County, 1985b).

From a vantage point atop the Santa Cruz Mountains, where Highway 92 meets Skyline Boulevard, panoramic views of the ocean and bay are possible. Continuing eastward down the side of the mountains, the road travels through

dense stands of trees, other natural vegetation, and streams before passing over the Upper and Lower Crystal Springs Reservoir. The Crystal Springs Reservoir is clearly visible from Highway 92, marking the end of the rural landscape west of the Junipero Serra Freeway (San Mateo County, 1985b).

b. Apanolio Canyon

The project expansion site is located in the northern portion of Apanolio Canyon along Apanolio Creek, on the coastal side of the Santa Cruz Mountains. Apanolio Canyon is a narrow canyon which extends about 1.8 miles northward into the steep ridges of Montara Mountain. Corinda Los Trancos Canyon lies immediately to the east, and State Highway 92 is situated approximately 2 miles south of the project.

The visual character of the project area is dominated by a natural, fairly undisturbed environment. The canyon interior features steep side slopes covered by coastal scrub vegetation and scattered tree groupings. Dense riparian and woodland stands are concentrated along the creek with woodland species also occurring along the upper canyon ridges.

Expansive views of the coastal region are possible from the canyon rim; however, only the interior portions of the canyon are visible below this elevation. The project site is not perceivable from State Highway 92 because of the gradual curvature of the canyon axis and by various intersecting ridges. Frenchman's Creek Road, a private road located along the western edge of the proposed fill, is the only paved access lending a partial view of the project site (Thomas Reid Associates, 1984).

c. Corinda Los Trancos Canyon

Corinda Los Trancos Canyon is situated in the western slopes of the Santa Cruz Mountains, north of State Highway 92 and east of Apanolio Canyon. The upper northern reaches of the canyon (to 1,000 feet) are currently used as a solid waste disposal site for San Mateo County. Visually, the working fill appears yellowish-brown against the undisturbed vegetative habitat on the upper slopes. The proposed forefill area of Corinda Los Trancos Canyon, located approximately 3,000 feet south of the existing landfill, encompasses 78 acres in the canyon interior. A haul road perpendicular to State Highway 92 bisects the lower canyon (including the forefill area) before entering the operating landfill site.

The terrain and vegetation in the forefill area are marked primarily by dense coast chaparral scrub on moderately steep east-facing slopes, interspersed with mature tree stands. In contrast, the drier west-facing slopes support few trees and are characterized by herbland and scrubland vegetative types. Approximately 19 acres of flat lands at the bottom of the canyon have been altered from a natural state for agricultural use (Thomas Reid Associates, 1984).

The forefill area is not visible from State Highway 92 due to the gradual bend of the canyon's interior walls and its lower elevation with respect to the existing landfill (Thomas Reid Associates, 1984).

d. Nuff Canyon

Nuff Canyon lies to the east of Corinda Los Trancos Canyon and runs in a north-south direction, perpendicular to Highway 92. An access road extends

northward about 1/3 mile from the highway where it reaches the gently sloping valley floor occupied by sediment ponds, a weigh scale, and other equipment associated with the Pilarcitos Quarry. At this point, the steep side slopes above the excavated areas are predominately brush covered.

To the north, beyond the quarry operations site, the canyon interior features moderately sloping sides with vegetation characterized by scattered mature tree groupings and lower-growing shrubs and grasses. Several plant types (e.g., alder, willow, and eucalyptus) are heavily concentrated along sections of the Nuff Creek drainage which follows the canyon bottom.

Further north along the access road, at approximately the 560-foot elevation, the canyon opens into a flat grassland currently used as a grazing area for horses. The road winds to the northeast before entering a larger meadow covered with low-growing grasses.

A cabin situated at the 700-foot elevation marks the end of the road. Beyond this area, the terrain rises somewhat sharply toward the northern boundary of Nuff Canyon.

Because of the elongated orientation of Nuff Canyon and the dense tree stands established near its intersection with State Highway 92, the canyon interior is not visible to observers on Highway 92 (Martin Carpenter Associates, 1985).

From the private access road through Nuff Canyon, views are confined to the quarry operations, the inside canyon walls, and the Nuff Creek channel.

4.11 Land Use Plans and Policies

a. Regional

Land Use

Apanolio, Corinda Los Trancos, and Nuff Canyons comprise a portion of the San Mateo County coastal range dividing the Pacific Ocean coastal plains from the southern San Francisco bay side. Both Apanolio and Corinda Los Trancos Canyons are contained within the 2,786-acre Ox Mountain Ranch while Nuff Canyon lies adjacent to and east of the property.

The coastal community of Half Moon Bay (population 8,091) located a few miles to the southwest, is the nearest incorporated area. The cities of Daly City, Menlo Park, San Carlos, San Mateo, Millbrae, and Redwood City are among those characterizing the bay side urbanization to the east--a sharp contrast with the rural and less populated western county region. The Santa Cruz Mountains, extending southeastward the length of the peninsula, feature densely forested and rugged terrain with slopes averaging 30 to 50 percent (San Mateo County, 1984).

The Crystal Springs Reservoir is situated approximately 3 miles east of Ox Mountain Ranch on property owned by the City and County of San Francisco. The entire parcel, encompassing 23,000 acres, is designated a State Fish and Game Refuge to protect the watershed areas adjacent to both the Crystal Springs and San Andreas Reservoirs (San Mateo County, 1985b).

Land use in the project vicinity consists primarily of open space and agricultural operations, although mixed residential and commercial uses are concentrated along the State Highway 92 corridor. The other most notable

uses present in this region are the solid waste landfill in Corinda Los Trancos Canyon and the Pilarcitos Quarry in the lower portion of Nuff Canyon.

Access to Half Moon Bay and to the unincorporated coastal area is provided by Highway 1 (Cabrillo Highway) following the coastline through Half Moon Bay and by State Highway 92 (Half Moon Bay Road), connecting Highway 1 on the west and Interstate Route 280 (Junipero Serra Freeway) on the east (*see Figure 4.4-1*).

Applicable Plans and Policies

Development activities in the San Francisco Bay Area are directed by various federal, state, regional and local government agencies sharing responsibility for planning decisions. An overview explanation of each agency's jurisdiction, regulatory authority, and appropriate concerns for the proposed landfill expansion is presented in Section 2.4, Regulatory Framework. Detailed analyses of plans, jurisdictions, and permits relating to the project are also contained in the appropriate sections.

For purposes of a land use analysis, the applicable documents that specifically address land use activity for San Mateo County, including solid waste issues, are defined in this section. These documents are the San Mateo County General Plan and accompanying zoning ordinance, the Local Coastal Program, and the Solid Waste Management Plan. Evaluation of the project's conformance with these plans and policies appears in the alternatives discussion under "Impacts" (Section 5.11).

General Plan

State planning law requires each county to prepare a General Plan citing plans, policies, and ordinances regulating topics including, but not limited to, transportation, cultural resources, rural land use, and solid waste. The main objective of the San Mateo County General Plan is to "provide overall policy guidance to assure orderly, balanced utilization and conservation of all county resources for this and future generations" (San Mateo County, 1985b). For each topic, the Plan's functional elements present a description of existing conditions, an assessment of problems and needs associated with the concern, and policies that set forth recommended objectives and actions.

Land use policy reflected in this document is implemented by the Planning Commission, which determines each project's consistency and conformance with the Plan. The zoning ordinance further gives the Planning Commission authority to determine compatibility of neighboring uses in regard to project proposals.

The Ox Mountain Ranch property is designated Resource Management - Coastal Zone/Coastal Development (RM-CZ/CD). The zoning classification for land adjacent to the Ox Mountain Ranch is either Planned Agricultural District (PAD) or Resource Management (RM). The principally permitted use in the PAD is agriculture with very low density single-family residential development. The RM-CZ zone is a general open space zone that allows agricultural and other low density uses (San Mateo County, 1985a).

Local Coastal Program

The Local Coastal Program (LCP) was approved and certified by the California Coastal Commission and the County Board of Supervisors in 1980, thereby transferring coastal permit authority from the State to the County. This certification was a result of the 1976 State Coastal Act which requires every local government with land in the Coastal Zone to prepare an LCP.

Pursuant to the LCP, Section 6328 of the County Zoning Ordinance stipulates that a Coastal Development Permit must be obtained for all development in the coastal zone. For a permit to be issued, a project must comply with the policies of the LCP and specific ordinances adopted to implement the LCP (San Mateo County, 1985c).

Solid Waste Management Plan

The County Solid Waste Management Plan was prepared in conformance with the requirements of the Nejedly Z'berg-Dills Act of 1972. The plan, which was initially approved in November 1977, was updated in 1984 to introduce a revised comprehensive solid waste management plan for San Mateo County over the next 20 years (San Mateo County, 1984).

The basic goal of the Plan is to "provide management of solid wastes in the most efficient and economical manner that will provide adequate services, protect the public health, prevent the creation of nuisances, reduce waste generation, conserve our natural resources and energy, provide for maximum resource recovery from solid waste, and enhance the beauty and quality of our environment" (San Mateo County, 1984).

Specific objectives of the Plan include (1) reducing to a minimum the dependence on landfills by promoting recycling, resource recovery, and reduction of residential and commercial wastes and (2) providing long-term landfill disposal capability for non-recoverable wastes (San Mateo County, 1984).

The County Board of Supervisors serves as the lead agency to coordinate the planning, implementation, and management of solid waste disposal activities of county-wide interest.

b. Apanolio Canyon

Land Use

Apanolio Canyon is located southeast of Ox Hill in unincorporated San Mateo County. The northern portion of the canyon presently remains in an undisturbed state, and no development exists within, or immediately adjacent to the site. A few residences are situated within a mile of the southern property line and one is located about 2 miles south of the project site near State Highway 92.

The nearest population concentration is approximately 3 miles from the project, in Half Moon Bay. Lands within the southern portion of the canyon are dedicated to cultivated agricultural use with a few acres used as grazing area.

The proposed project area is completely surrounded by open space. Adjacent lands are contained in the privately owned Ox Mountain Ranch.

Plans and Policies

A summary of the plans and policies that direct land use activity in Apanolio Canyon is provided in Section 4.11a.

Both the Solid Waste element of the General Plan and the LCP acknowledge Apanolio Canyon as suitable for a future solid waste disposal facility. As mentioned earlier in this section, a Coastal Development Permit must be obtained for development in the Coastal Zone. On February 22, 1984, San Mateo County approved Coastal Development Permit CDP 82-4 for a landfill expansion in Apanolio Canyon (Thomas Reid Associates, 1986).

The Apanolio Canyon project site is included in the RM-CZ/CD zoning district which allows waste disposal sites subject to an approved use permit (Section 6315, Zoning Ordinance). The existing use permit, issued on February 22, 1984 by San Mateo County, for a landfill expansion in Apanolio Canyon (UP 82-3) will be reviewed 25 years after disposal operations have commenced in the canyon. Grading Permit GP 86-7 was issued on August 13, 1986 for the expansion in Apanolio Canyon (Thomas Reid Associates, 1986).

The Solid Waste Management Plan, in recognizing the long-term need for operating landfills in the County regardless of the extent of resource recovery, designates the canyon as a solid waste disposal site. Policy 2 states "that with respect to the Ox Mountain Sanitary Landfill, development of Apanolio Canyon by the owner for landfill purposes be encouraged by affected public agencies subject to meeting appropriate conditions and accepted standards" (San Mateo County, 1984).

c. Corinda los Trancos Canyon

Land Use

Corinda Los Trancos Canyon, located on Ox Mountain Ranch in unincorporated San Mateo County, is the site of the currently operating Corinda Los Trancos Canyon Landfill. The general land use pattern in the immediate vicinity is characterized by privately owned open space to the west and north, quarrying operations to the east over the canyon ridges, and State Highway 92 to the south.

Within the middle canyon, the upper slopes are undeveloped and about 19 acres of the bottom portion are utilized for agriculture, including a tree farm, a caretaker's residence, and a garage. The existing landfill encompasses approximately 51 acres northeast of the forefill project area in the upper reaches of the canyon.

Applicable Plans and Policies

Land use activity in Corinda Los Trancos Canyon is subject to the same local plans and policies that direct development in Apanolio Canyon. These are discussed in more detail in Sections 4.11a and b. According to the General Plan and the LCP, the proposed land use classification given to the forefill site is open space (San Mateo County, 1985c).

The forefill property has an RM-CZ/CD zoning designation which, as mentioned earlier, conditionally permits solid waste disposal activity (Thomas Reid Associates, 1984).

d. Nuff Canyon

Land Use

Situated directly east of Corinda Los Trancos Canyon, Nuff Canyon extends northward from State Highway 92. The principal land use within Nuff Canyon is the Pilarcitos Quarry currently leased by Piombo Corporation. The mineral resource being mined is a granodiorite bedrock material suitable for use as backfill for pipe trenches, road subbase, general fill, and occasionally road base. Quarrying activities and mining-related structures currently occupy 40 acres in the canyon bottom about 1/3 mile from State Highway 92. The quarry services market areas east of the Coastal Range, as well as smaller markets in Half Moon Bay and adjacent coastal areas. The cost of transport of aggregate material is high, generally limiting competitive market areas to approximately a 25-mile radius (Mac Carpenter, pers. comm., May 4, 1987). Other quarries in the San Mateo County region are located in the City of Brisbane, and in Santa Clara and Alameda counties. Because transportation costs are a limiting factor in the competitive market and few quarries exist in the County, the Pilarcitos quarry is significant to this portion of San Mateo County.

Future quarry operations in this area would continue northward into the canyon, ultimately affecting 287 acres of the total 593-acre site. The entire site consists of four separate parcels, all under private ownership at this time (Martin Carpenter Associates, 1985).

Other uses in Nuff Canyon include a cabin located toward the canyon's northern reaches, and scattered grazing lands found along the interior dirt

road. Activities downstream from the quarry in close proximity to State Highway 92 include pheasant raising and trout farm operations, as well as a part-time residence located between the quarry scale house and Highway 92.

Except for the Ox Mountain Sanitary Landfill to the west, much of the surrounding property to the north, east, and west of Nuff Canyon is open space and agricultural land. Other uses found on smaller parcels fronting the southern edge of State Highway 92 opposite Nuff Canyon are several residences, a trout farm, and a tree farm/nursery operation.

Plans and Policies

Nuff Canyon is located inside the coastal zone boundary; therefore, land use activity here is guided by the LCP, the General Plan, and the county zoning ordinance. The proposed land use category for Nuff Canyon, including the project site, is Open Space under the Rural Land Use chapter of the General Plan (San Mateo County, 1985a). The Mineral Resources chapter designates the canyon as MRZ-2 (significant stone), a classification assigned by the California Division of Mines and Geology when adequate information is available to identify the presence or high likelihood of the presence of significant resource deposits (San Mateo County, 1985b).

Similar to Apanolio and Corinda Los Trancos Canyons, Nuff Canyon is also included in the RM-CZ/CD district; conditionally permitting solid waste disposal activity.

4.12 Economics

Population

Between 1970 and 1980, San Mateo County experienced a 5.6 percent rise in population to 587,329 persons, compared to an 11.9 percent growth rate for the nine-county Bay region during the same period. By 1985, the population in the county was 607,550, indicating a 3.4 percent change from 1980. The regional population grew to over 5.5 million by 1985, representing a 6.8 percent increase from 1980. Historic population for both San Mateo County and the region is presented in Table 4.12-1.

Table 4.12-1. Historic Population
San Mateo County and Regional
1970 - 1985

	<u>1970</u>	<u>1980</u>	<u>1985</u>	<u>Percent Change 1970-1980</u>	<u>Percent Change 1980-1985</u>
San Mateo County	556,234	587,329	607,550	5.6%	3.4%
Regional	4,628,199	5,179,784	5,531,950	11.9%	6.8%

Source: Association of Bay Area Governments, 1987. Projections '87, April.

Population estimates through the year 2005 for each of the Bay Area counties were prepared by the Association of Bay Area Governments (ABAG) in its report, Projections '87. Because of contributing factors such as lower birth rates and reduced in-migration to the area, the historical high rate of increase is expected to decline (ABAG, 1987). While the average annual growth rate for San Mateo County between 1970 and 1985 was 0.6 percent, it

is anticipated to be 0.4 percent for the following 20-year period.

Table 4.12-2 illustrates projected population for San Mateo County and the region.

Table 4.12-2. Projected Population
San Mateo County Region
1985 - 2005

	<u>1985</u>	<u>1995</u>	<u>2005</u>	<u>Percent Change 1985-1995</u>	<u>Percent Change 1995-2005</u>
San Mateo County	607,550	639,250	658,550	5.2%	3.0%
Regional	5,531,950	6,207,500	6,663,400	12.2%	7.3%

Source: Association of Bay Area Governments, 1987. Projections '87, April.

Housing

Household Characteristics

In 1985, there were approximately 2.1 million households in the Bay Region (as defined by ABAG), of which 233,170, or 11.1 percent of these, were located in San Mateo County. ABAG predicts the total number of households in the County to jump 16.6 percent between 1985 and 2005, while the region overall is expected to gain 0.5 million households during this period, indicating a 27.4 percent change. These household projections are shown in Table 4.12-3.

Table 4.12-3. Projected Households

	<u>1985</u>	<u>1995</u>	<u>2005</u>	<u>Percent Change 1985-2005</u>
San Mateo County	233,170	256,020	271,830	16.6%
Regional	2,093,900	2,420,990	2,666,600	27.4%

Source: Association of Bay Area Governments, 1987. Projections '87, April.

In 1985, the household size for San Mateo County averaged 2.57 persons and is expected to decrease to 2.39 persons per household by 2005. Overall, California is realizing a smaller household size, thereby increasing the need for additional housing (ABAG, 1987).

Housing Stock

The attractive geographical location of San Mateo County relative to the Bay Region creates a significant demand for new housing; this need will concentrate particularly along the bay side in the north, central, and south County areas. Land availability is diminishing; therefore, planning strategies such as redevelopment and reuse of underutilized sites will be important steps in accommodating future households (ABAG, 1987).

Other growth constraints associated with infrastructure could restrict development in some parts of the County. These include access to Highway 101 and other transportation concerns, flood control, and sewage improvements.

The communities in San Mateo County are anticipated to add approximately 39,000 new dwelling units between 1985 and 2005; 24 percent of this

additional housing requirement is expected in the the Redwood City sphere of influence (ABAG, 1987).

Table 4.12-4 compares the number of potential housing units with the projected households through 2005.

Table 4.12-4. Comparison of Household Growth with
Potential Housing Units, San Mateo County
1980 - 2005

	<u>Potential Housing Units</u>	<u>Projected Households</u>	<u>Units Less Households</u>
<u>Subarea</u>			
North County	10,930	12,330	-1,400
Central County	10,370	11,070	- 700
South County	13,930	14,100	- 170
Coastside	<u>10,120</u>	<u>9,110</u>	<u>1,010</u>
Total County	45,350	46,600	-1,250

Note: Totals may not add due to rounding.

Source: Association of Bay Area Governments, 1987. Projections '87, April.

Employment and Income

San Mateo County's employment structure is generally well balanced; consequently, it is not entirely subject to slow downs that may result in a region dominated by economically sensitive industries. For several decades, employment in the county has increased more rapidly than population (San Mateo County, 1985b).

During the 1960 to 1980 period, the economic activity of San Mateo County rose dramatically, reflecting an employment growth of 98 percent. This growth can somewhat be attributed to the County serving as a viable alternate location to San Francisco for office space use. The County should continue to benefit economically, due to its location between downtown San Francisco and the electronics industries of the Silicon Valley (ABAG, 1987).

From the years 1980 to 1985, employment in the County constituted 10 percent of the total jobs in the Bay Region. Close to 58 percent of this employment was concentrated in the services, retail trade, and manufacturing sectors, while agriculture, mining, and construction accounted for about 7 percent of the jobs (ABAG, 1987). The percentage of employment in the transportation sector is considerably higher than the regional average, primarily due to the San Francisco International Airport (San Mateo County, 1985b). San Mateo County had the second lowest unemployment rate in the state at 3.9 percent in 1985 (EDD, 1986).

Between 1985 and 2005, ABAG estimates over 85,000 new jobs will be created in the County, bringing the total to 366,500. The largest gains are expected in the wholesale trade, and finance, insurance, and real estate industries, while the agriculture/mining sector is anticipated to decline. Services represented the highest employment in the County in 1985 and will continue this trend through 2005, with 94,540 jobs. Most of these positions will occur in private sector services, such as medical, business, hotel, and recreation employment (ABAG, 1987).

Historic and projected employment in San Mateo County by division is presented in Table 4.12-5.

Table 4.12-5. Historic and Projected Employment,
San Mateo County
1980 - 2005

<u>Division</u>	<u>1980</u>	<u>1985</u>	<u>1995</u>	<u>2005</u>
Agriculture, Mining	4,558	4,190	3,920	3,340
Construction	13,870	14,770	19,030	18,820
Manufacturing	40,930	37,510	41,610	39,300
Transp., Comm., Util.	32,220	34,310	43,890	51,070
Wholesale Trade	18,580	22,800	27,590	34,660
Retail Trade	42,875	53,000	71,390	71,890
F.I.R.E.	20,400	22,960	29,710	33,450
Services	67,822	73,200	88,410	94,540
Government	<u>18,540</u>	<u>18,560</u>	<u>19,250</u>	<u>19,440</u>
TOTAL	259,795	281,300	344,800	366,500

Source: Association of Bay Area Governments, 1987. Projections '87, April.

BFI currently employs 317 persons on a full-time basis; 19 of these positions are maintained at the existing Corinda Los Trancos Canyon landfill. The 1986 annual payroll for BFI personnel in San Mateo County was \$9.3 million (Day, pers. com., September 16, 1987).

Local Labor Force

Between 1985 and 2005, ABAG projects the local labor supply to increase by 52,000 individuals, 17,000 less than previous estimates stated in

Projections '85. Because 85,000 new jobs are anticipated in the County during this period, a potentially tight labor market could be realized. Consequently, local labor costs could rise more rapidly than predicted. However, a limited local labor supply could also result in less commuting for residents to other County employment centers (ABAG, 1987).

Income

From a regional as well as a statewide perspective, San Mateo County can be considered fairly affluent. In 1985, the median annual household income for San Mateo County was \$44,200, ranking it third highest of those in the Bay Region after Marin and Contra Costa Counties, respectively. Projections indicate the average annual income for the County to increase 16.5 percent by 2005 to \$51,500 (ABAG, 1987).

Solid Waste Collection, Hauling, and Disposal Costs

A typical household in the Ox Mountain Sanitary Landfill service area pays about \$110 annually for solid waste services, or \$70.50 per ton. This estimate assumes that the average household generates 60 pounds of refuse per week. The residential fee of \$110 includes costs incurred for collection, hauling, disposal (or tipping), and operations at the landfill (Day, pers. com., September 18, 1987).

Costs associated with hauling waste from the San Carlos transfer station to the Ox Mountain Sanitary Landfill are approximately \$11.50 per ton. This includes a \$7.50 tipping fee and \$0.10 per mile based on a 40-mile round trip. Of the tipping fee, \$1.15 is passed back to the County as a surcharge

to cover costs for implementation of the SWMP and other management expenses (Day, pers. com., September 18, 1987).

The Ox Mountain Sanitary Landfill receives approximately 92 percent of San Mateo County's refuse; 45.9 percent of this is transported from the San Carlos transfer station (Laakso, pers. com., August 31, 1987).

Fiscal Issues

San Mateo County adopted a 1987-88 fiscal year (FY) budget of \$438.5 million, of which \$331.9 million is allocated to the General Fund. Aid from state and federal programs is anticipated to be \$91.7 million and \$37.7 million, respectively. Of the overall county budget, funds appropriated for solid waste management total \$1.1 million, including \$776,000 expected from the solid waste surcharge presently imposed on both the Ox Mountain Sanitary Landfill plus the disposal fees collected at the Pescadero transfer station (Bee, pers. com., September 19, 1987).

Estimated FY 87-88 property tax revenues for San Mateo County are \$86 million, while sales and use taxes amount to \$8.4 million (Bee, pers. com., September 19, 1987).

Property taxes paid in 1986-87 for the then 2398-acre Ox Mountain Ranch property owned by BFI were \$50,265. About 71 percent of this sum was for improvements exceeding \$3.3 million, and the remaining 29 percent, or \$14,765 was for land assessed at \$1.38 million. BFI has since acquired 388.5 additional acres in the ranch with an appraised land value of \$760,160 (Day, pers. com., September 18, 1987).

5.0 ENVIRONMENTAL CONSEQUENCES

5.1 Geology, Soils, and Seismicity

a. Apanolio Canyon - 1,200-foot

Topography

Construction of the project would permanently alter the topography of the northern portion of Apanolio Canyon. The natural canyon topography would be modified by placement of fill. The benched face of the landfill would be a southerly facing 3:1 slope and the natural east and west facing slopes would be eliminated. A relatively level area would be formed at the 1,200-foot elevation.

Slope Stability

Slope stability problems could occur in the project area as a result of steep topography, unstable colluvial soils, and extensively weathered bedrock conditions. These conditions could lead to slope failure in the event of severe seismic ground shaking.

Construction

Construction of the landfill would require staged removal of vegetation and soil from Apanolio Canyon. Concurrent with filling the canyon with refuse, the canyon walls would be progressively stripped, starting at the bottom of the canyon and gradually working toward the ridge lines. Material removed would be used for daily cover. The removal of vegetation and soil could potentially reduce support for the colluvial materials upslope, and create slope instability resulting in landslides. Access road construction on steep slopes in certain areas, would cut into colluvium and weathered

bedrock. This could aggravate existing unstable slope conditions, adversely affecting stability both upslope and downslope of the cut. Because of the nature of landfill operations, slope instability is largely a maintenance rather than a safety problem. Frequent removal of slide debris and regular slope protection measures may be necessary along access roads cut into steep, unstable slopes.

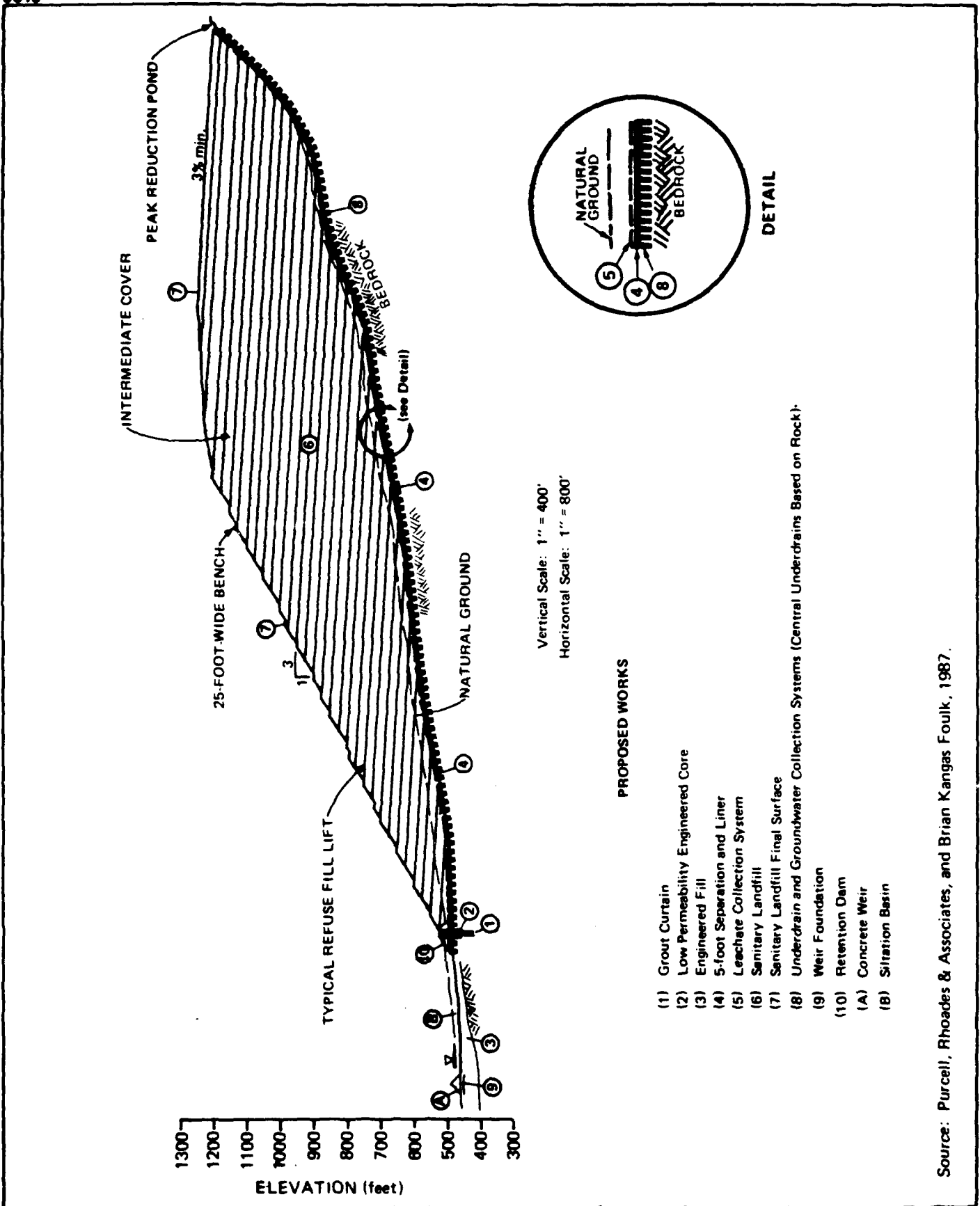
A longitudinal section of the landfill (A-A' Figure 4.1-3), presented in Figure 5.1-1, illustrates the variation in depth of overburden from the toe of the proposed fill to the upper portion of the canyon.

Erosion and Sedimentation

Construction of the landfill and access roads would require removal of vegetation and soils increasing the potential for erosion. This erosion could increase siltation and sedimentation in Apanolio Canyon Creek and Pilarcitos Creek as well as contribute to slope instability. Drainage control measures, revegetation, and proper maintenance of the project's sedimentation basin would reduce the magnitude of sedimentation impacts to Apanolio Creek (see Section 5.2a.).

Landfill Liner

The greatest potential impact from slope instability is the effect on the landfill liner and underdrain system during construction. The steep slopes require placement of the clay liner in strict conformance with geotechnical engineering design to ensure the integrity of the completed leachate and ground-water control systems. Areas of intensely weathered bedrock, which could be subject to bedrock landslides, would be removed



Source: Purcell, Rhoades & Associates, and Brian Kangas Foulk, 1987.



Harding Lawson Associates
Engineers and Geoscientists

Apanolio Canyon Longitudinal Section
Ox Mountain Sanitary Landfill
Apanolio Canyon Expansion EIS
San Mateo County, California

FIGURE

5.1-1

DRAWN
CSN

JOB NUMBER
6234,031.01

APPROVED

DATE
4/88

REVISED

DATE

prior to placement of the subgrade barrier/clay liner. The seismic potential of the project area could further aggravate slope stability and increases the risk of potential damage to the liner.

A failure of the landfill liner could allow leachate to move through the liner and infiltrate into the ground-water system. The highly weathered and fractured Montara Granodiorite is relatively permeable with respect to the unweathered rock and could allow leachate migration. Leachate contaminated ground water could also infiltrate into the fresh bedrock, but at a much slower rate. The landfill liner, leachate and water management systems have been designed to withstand the maximum probable earthquake (mpe) on the nearby San Andreas fault (M 8.3 on Richter scale). Implementation of the contingency plan for protection of water resources would prevent or reduce the magnitude of downstream impacts should a failure in the containment system occur. Further discussion of water quality impacts is contained in Section 5.2, Hydrology and Water Quality.

b. Apanolio Canyon - 850-foot

Topography

Construction of the project would permanently alter the topography of the northern portion of Apanolio Canyon as with the 1,200-foot alternative. However, the magnitude of the topographic impacts would be less under this alternative. Portions of the natural east and west facing slopes, primarily above the 850-foot elevation, would not be eliminated. A relatively level area smaller in extent than under the 1,200-foot alternative would be formed at the 850-foot elevation.

Slope Stability

Impacts associated with slope stability under this alternative would be very similar to the proposed project. Slope failures may be reduced somewhat because the upper slopes of the canyon would not be disturbed.

Erosion and Sedimentation

The potential for erosion and sedimentation would be reduced under this alternative. A smaller area would be disturbed and therefore less erosion would occur. Additionally, since the bedrock is more deeply weathered near the ridge tops (see Section 4.1), the bedrock material exposed by landfill construction in the lower elevations of the canyon may be less susceptible to erosion.

Landfill Liner

The potential for failure of the landfill liner may also be reduced as it would be smaller in areal extent and would not be placed on the upper slopes of the canyon. However, the same potential for failure of the landfill liner in the lower elevations in the canyon would exist. The potential for this alternative to impact water quality would be similar or slightly less than the proposed 1,200-foot project. Similar design procedures would be followed with this alternative to protect water resources from liner failure in the event of seismic activity.

c. Corinda Los Trancos Canyon - Forefill

Topography

Construction of the project would permanently alter the topography of Corinda Los Trancos Canyon. The natural canyon slopes would be replaced by

fill having a benched slope of approximately 3:1 facing west-southwest. The natural slopes along the eastern portion of the proposed forefill area would be eliminated.

Slope Stability

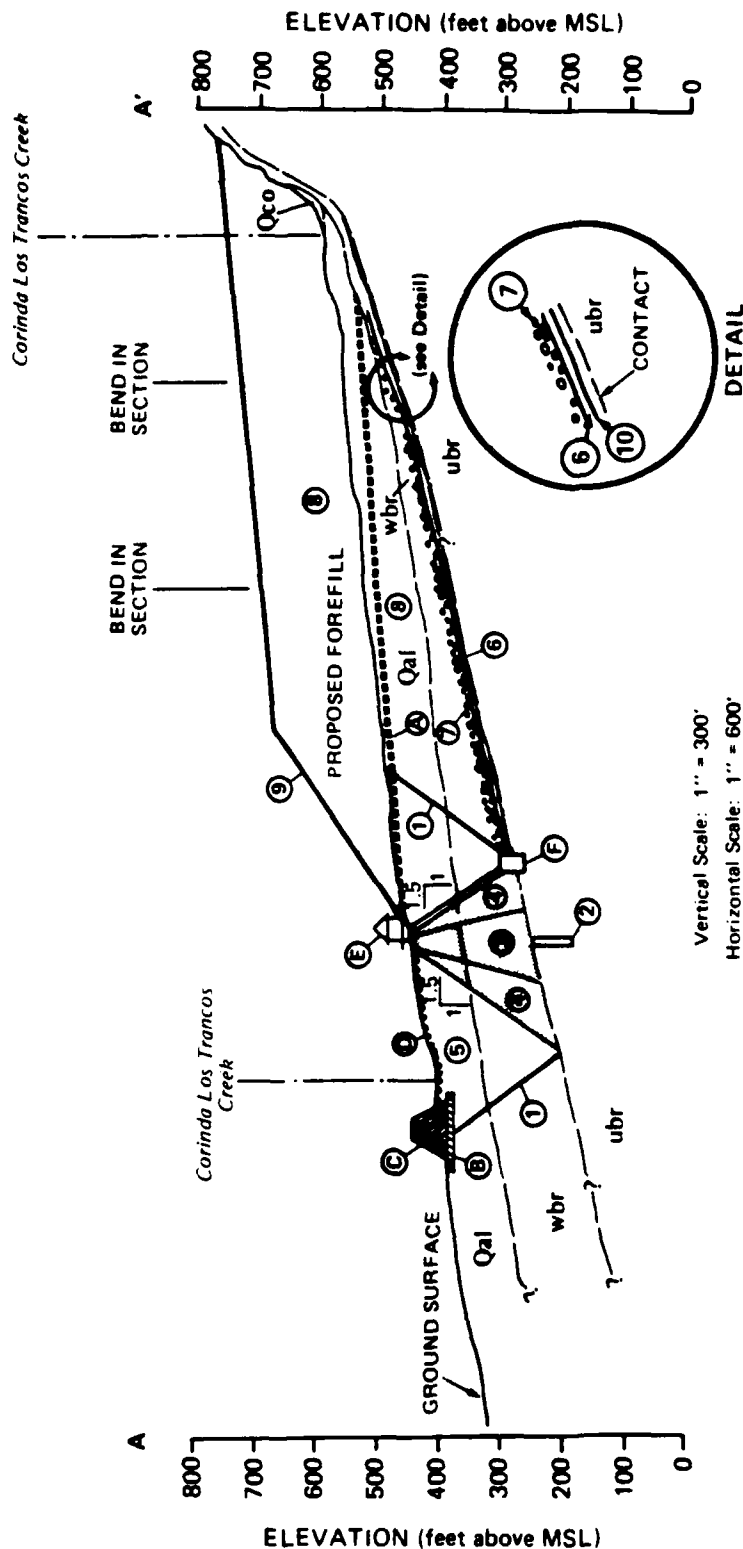
The potential impact on slope stability would be reduced under this alternative. Because the slopes in the forefill area are less steep than in Apanolio Canyon, the potential for slope failure associated with landfill and access road construction would be reduced. Seismic impacts may be slightly greater with this alternative due to the site's closer proximity to the San Andreas fault.

Construction

A longitudinal section of the proposed landfill, following the Corinda Los Trancos Creek channel (A-A' Figure 4.1-5), is presented in Figure 5.1-2. This figure illustrates the thickness of the alluvial sediment and weathered bedrock that would require removal under this alternative. An estimated 5.1 million cubic yards of sediments and weathered bedrock would be excavated prior to construction of the landfill liner and leachate collection system.

Erosion and Sedimentation

Erosion and sedimentation would be reduced under this alternative since the slopes are not as steep as in Apanolio Canyon and the landfill would be smaller. The more gentle slopes would produce lower runoff velocities which could reduce erosion. The reduction in slope failures discussed above could reduce the amount of material susceptible to erosion.



Vertical Scale: 1" = 300'
Horizontal Scale: 1" = 600'

PROPOSED WORKS

- (1) Open Sky Initial Excavation
- (2) Cut-off Curtain
- (3) Low Permeability Engineered Core
- (4) Engineered Fill I
- (5) Engineered Fill II
- (6) 5-foot Separation and Liner
- (7) Leachate Collection System
- (8) Sanitary Landfill
- (9) Sanitary Landfill Final Surface
- (10) Central Underdrain
- (A) Lateral Underdrains, Based on Rock
- (B) Weir Foundation
- (C) Weir
- (D) Synthetic-Lined Siltation Basin
- (E) Leachate and Underground Flow Control Stations
- (F) Leachate and Underground Flow Pump Stations

EXPLANATION

- Qal - Quaternary Alluvium
Qco - Quaternary Colluvium
wbr - Weathered Bedrock (Montara granodiorite)
ubr - Unweathered Bedrock (Montara granodiorite)
- Geologic Contact (dashed where approximately located)

Source: Purcell, Rhoades & Associates, and Brian Kangas Foulk, 1987.

Landfill Liner

Placement of a competent landfill liner on the more gradual slopes of the forefill area may be more feasible than on the steeper slopes of Apanolio Canyon. As with other alternatives the liner and leachate collection system would be designed to withstand maximum probable seismic events.

d. Nuff Canyon

Topography

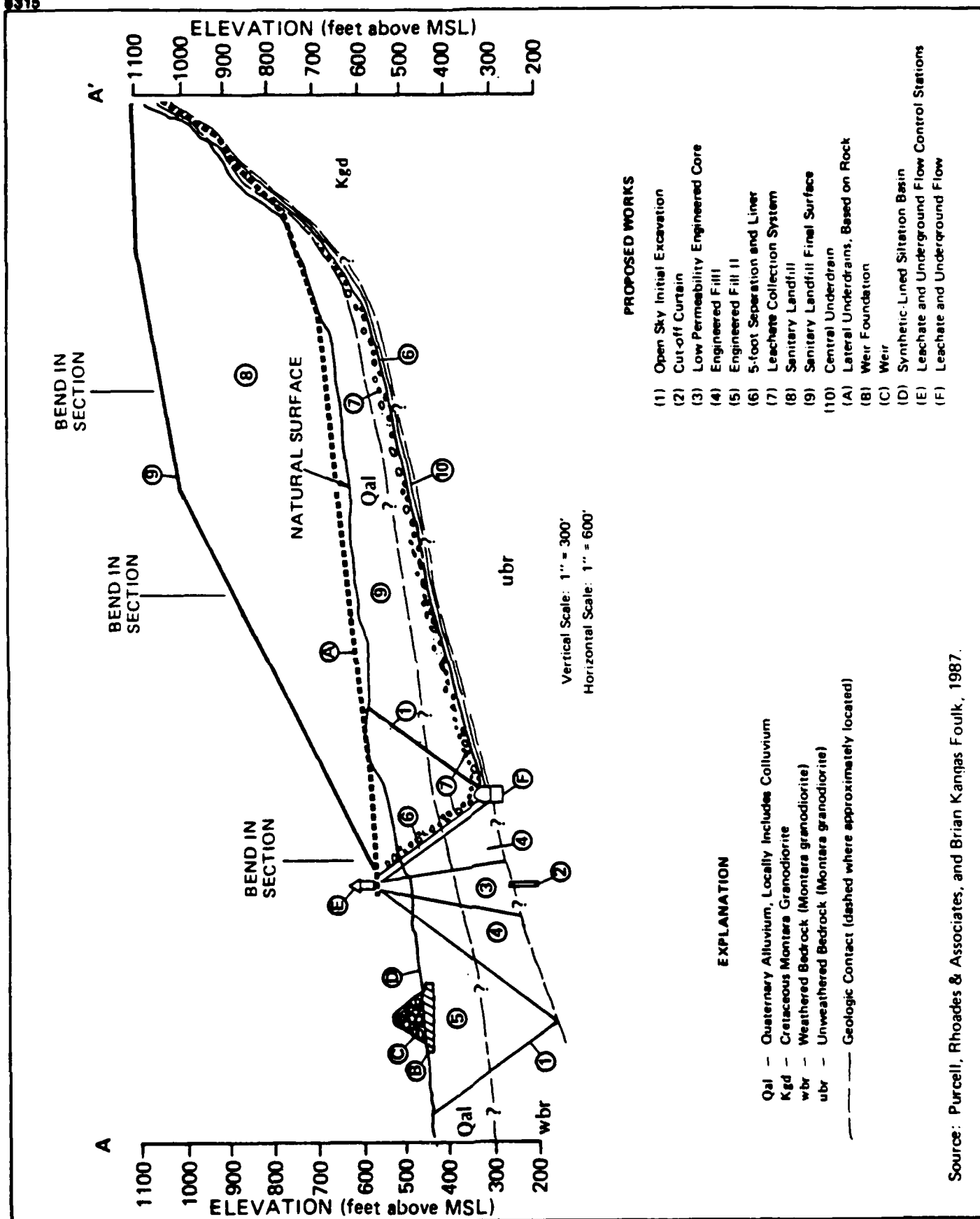
Construction of the project would permanently alter the topography of the northern portion of Nuff Canyon. The natural canyon slopes would be replaced by fill having a southerly facing benched face with an approximate slope of 3:1 and the natural east and west facing slopes would be eliminated. A relatively level area would be formed at the 1,100-foot elevation.

Slope Stability

Impacts on slope stability would be about the same under this alternative as those for the Apanolio Canyon 1,200-foot alternative. Seismic impacts could be greater under this alternative due to the closer proximity of Nuff Canyon to the San Andreas fault.

Construction

A longitudinal section of the proposed landfill, following the Nuff Creek channel (B-B' Figure 4.1-7), is presented in Figure 5.1-3. This figure illustrates the thickness of the alluvial and weathered bedrock that would require removal under this alternative. An estimated 8.6 million



Source: Purcell, Rhoades & Associates, and Brian Kangas Foulk, 1987.

HLA
 Harding Lawson Associates
 Engineers and Geoscientists

Nuff Canyon Longitudinal Section
 Ox Mountain Sanitary Landfill
 Apanolio Canyon Expansion Site EIS
 San Mateo County, California

FIGURE

5.1-3

DRAWN
 CSN

JOB NUMBER
 6234,031.01

APPROVED

DATE
 4/88

REVISED

DATE

cubic yards of sediments and weathered bedrock would be excavated prior to construction of the landfill liner and leachate collection system.

Erosion and Sedimentation

Because the geology in Nuff Canyon is believed to be similar to that in Apanolio Canyon, no significant change from the 1,200-foot Apanolio Canyon alternative regarding the potential impacts associated with erosion and sedimentation would be expected.

Landfill Liner

Due to similar conditions in Nuff Canyon and Apanolio Canyon, no significant differences in landfill liner impacts would be expected under this alternative. The liner and related facilities would be designed to withstand the maximum probable earthquake (mpe).

e. No Action

The No Action Alternative would eliminate the potential geology, soils, and seismicity impacts associated with the proposed project. However, it would then be necessary to locate another option for refuse disposal for San Mateo County.

f. Mitigation Measures

- All unstable soils and weathered bedrock shall be removed from the landfill area prior to placement of the subgrade barrier/clay liner.
- All unstable material shall be removed from existing landslides which may be effected by construction of the landfill or access roads.
- In areas of extensively fractured and weathered bedrock, all unstable material shall be removed to avoid slope failure.

- Impoundments for holding water or leachate shall be designed to withstand ground shaking from the maximum probable earthquake (mpe) expected at the site.
- An erosion and sedimentation control plan shall be presented to the County prior to landfill construction.
- BFI shall develop a contingency plan in compliance with Title 23, Subchapter 15 (CAC) requirements to provide for protection of water quality in the event of failure of the landfill liner.

5.2 Hydrology and Water Quality

a. Apanolio Canyon - 1,200-foot

Hydrology

Construction of the Apanolio Canyon landfill would increase mean annual Apanolio Creek streamflows by 19 percent, from 697 acre-feet (0.96 cfs) to 829 acre-feet (1.2 cfs) at the BFI property line (Hydrocomp, Inc., 1988) over the 93-year life of the landfill. However, peak, hourly, and daily flood flow discharges from Apanolio Creek would be decreased due to topography changes and peak flow storage. The landfill's "peak retention ponds" and sediment basin would minimize the magnitude of peak flows (Hydrocomp, Inc., 1988) by increasing the duration of the flow event (e.g., maintain above average streamflows for a longer period of time, rather than a short duration, extreme flow event). Consequently, construction and operation of the Apanolio Canyon Landfill would result in slightly lower flood flows. Apanolio Creek summer flows (July through September) are estimated to decrease from 0.05 cfs to 0.03 cfs as the landfill approaches capacity over its lifetime. This represents a 40 percent reduction in summer flows toward the latter years of landfill operation.

To compensate for the decrease in summer low flows in Apanolio Creek, BFI has developed a streamflow augmentation plan (Appendix D) that would provide maintenance of existing summer low flows. This would prevent any reduction in flows at the BFI property boundary and would prevent project related impacts to downstream beneficial uses of surface flows.

The estimated increase of mean annual streamflows is largely due to the increased runoff from the the proposed landfill crown and "benched" areas. Mean annual runoff from the landfill's crown and benched areas is estimated to be 50 percent greater than natural, existing conditions (Hydrocomp, Inc. 1988). Vegetative cover and other factors affecting water yield would be left relatively unchanged in the remaining 79 percent of the basin area.

Associated with the landfill's construction and operation would be an increase in sediment loads into lower Apanolio Canyon. Computer simulations by Hydrocomp, Inc. (1988) indicate that, without the implementation of proper erosion and sediment control practices, sediment loads into lower Apanolio Canyon could be increased five fold. Conversely, these simulations also indicate that the total project-induced sediment load could be reduced to the total natural, baseline load by restricting the size of unvegetated hill and landfill crown areas, in conjunction with installation and operation of the project's proposed sedimentation control facilities.

The excavation of overburden materials in the project area and the construction of the grout curtain at the toe of the proposed landfill would impact ground-water flow within the canyon. These activities and structures would prevent any ground-water flow from the northern portion of the canyon

into the alluvial aquifer occupying the southern portion of the canyon. Ground water flowing from the alluvial and unweathered bedrock units in the project area would be intercepted by the landfill's ground-water collection system and discharged to Apanolio Creek as surface flow. To prevent impact to beneficial uses of ground water in the southern portion of the canyon, BFI has developed a plan to install a series of ground-water recharge wells. These four injection wells would be installed below the monitoring well locations as illustrated in Figure 4.2-2. The preliminary design of these wells is provided in Appendix D. Currently, a recharge rate of 12 gallons per minute (gpm) (3 gpm per well) would be provided.

Water Supply

Uses

Construction and operation of the Apanolio Canyon landfill would result in changes in water quality and volume and duration of flows. These changes could impact the beneficial uses of the waters in the basin. Potential impacts to the availability and quality of waters for crop irrigation, domestic supply and fish and wildlife habitat could occur. Potential impacts are also discussed in Section 5.3, Biology.

Water Quality

The types and magnitudes of water quality impacts resulting from the construction and operation of the Apanolio Canyon landfill are largely contingent upon: (1) the effectiveness of the project's soil erosion control measures, (2) the ability to prevent surface and ground waters from flowing through the landfill and (3) the effectiveness of the liner in containing landfill leachate.

As previously noted, project construction and operation would induce soil erosion and increase sediment loads in the project area. Although nearly all of the material would be captured within the sediment traps and sedimentation basin, some, primarily clay particles, would continue downstream, but the total sediment load in Apanolio Creek should not exceed natural conditions. Hydrocomp, Inc. (1988) estimates that the project's sediment traps would capture 100 percent of the sand, 83 percent of the coarse silt, 62 percent of the fine silt, and approximately 8 percent of the clay particles that are eroded from the project area. Overall, it is anticipated that the sediment traps and sedimentation basin would capture approximately 84 percent of all soil material eroded from the project site.

Although mitigation measures would be implemented to reduce the total sediment load (e.g., sand on down to clay sized particles) to pre-project levels by removing a disproportionate amount of sand relative to clay particles, project construction and operation could, despite the presence of sediment traps and a sedimentation basin, increase the turbidity of Apanolio Creek waters, primarily through an increase of clay particle concentrations.

Limited data collected by Hydrocomp, Inc. (1988) indicate that concentrations of total suspended solids in Apanolio Creek currently range from 40 to 2300 milligrams per liter, depending upon streamflow rates and other environmental conditions. These concentrations could increase, depending upon the amount or increased erosion and sediment trap efficiencies actually obtained during project construction and operation.

Although unlikely, a failure of the landfill's clay liner or leachate collection and control system could release a variety of waterborne contaminants into the basin's surface or ground waters, thereby impacting domestic and/or agricultural water supplies dependent on these waters. BFI proposes to install a grout curtain system at the toe of the landfill to further protect the ground-water quality. Any contaminants that may escape the landfill should be contained by this system. However, if the grout curtain cannot effectively seal off all permeable bedrock fractures, a bedrock monitoring program has been designed upgradient and downgradient from the curtain to detect any contaminants in the ground-water system. This contingency, and a second grout curtain may be installed if drawdown wells are not effective. These actions would minimize or prevent degradation of downstream water resources. However, because Apanolio Creek appears to *have a limited hydrologic connection* with the aquifer in the lower canyon, leachate contamination of the ground water would be limited *and would be expected to occur at a very slow rate* if leachate spilled into the creek. It also appears that, because of the *limited hydrologic connection* of the lower aquifer and the creek, *any* migration of a leachate plume in ground-water resources may not contaminate Apanolio Creek (Purcell, Rhoades and Associates, 1988).

b. Apanolio Canyon - 850-foot

Hydrology

The hydrologic impacts resulting from the construction and operation of the 850-foot (perimeter elevation) landfill are essentially the same as those associated with the construction and operation of the 1,200-foot

(perimeter elevation) Apanolio Canyon Landfill. However, with the reduced project approximately 150 acres of vegetation would remain in the upper watershed to potentially absorb runoff and reduce the quantity of surface- and ground-water flows requiring diversion.

Water Supply and Water Quality

Impacts to beneficial uses and water quality from construction and operation of the 850-foot landfill are essentially the same as those associated with the construction and operation of the 1,200-foot Apanolio Canyon Landfill.

c. Corinda Los Trancos Canyon - Forefill

Hydrology

Construction of a forefill project in Corinda Los Trancos Canyon would most likely increase the basin's rainfall runoff and the resulting Corinda Los Trancos Creek streamflows. As previously noted, mean annual runoff from the proposed Apanolio Canyon Landfill's devegetated crown and benched areas is estimated to be approximately 50 percent greater than existing conditions. Assuming this 50 percent increase in runoff, the resulting annual average Corinda Los Trancos Creek streamflows would be increased by approximately 11 to 13 percent, from 594 acre-feet (0.82 cfs) to 673 acre-feet (0.93 cfs) over the life of the project. However, sedimentation control and storm water management facilities would minimize the magnitude of peak flows.

Associated with construction and operation of a forefill project would be an increase in sediment loads into the lower Corinda Los Trancos Basin.

The magnitude of these sediment loads would be partially dependent upon the effectiveness of the erosion control measures implemented.

Water Supply

Uses

As stated previously in Section 4.2, Hydrology and Water Quality, the primary beneficial use of water in the Corinda Los Trancos Basin is for agricultural irrigation and to a lesser extent, nondomestic supply. Increased sediment loads may adversely affect the usability of this water for irrigation.

Water Quality

As with the Apanolio Canyon alternatives, the types and magnitudes of water quality impacts resulting from the construction and operation of the Corinda Los Trancos Canyon forefill project would be largely contingent upon (1) the effectiveness of the project's soil erosion control measures, (2) the ability to prevent surface and ground waters from flowing through the landfill, and (3) the effectiveness of the liner in containing landfill leachate.

Preliminary design specifications have been prepared for the forefill project with regard to leachate collection and containment. The leachate management system (i.e., subgrade barrier/clay liner and leachate collection system) is similar to that proposed for the *applicant's* preferred Apanolio Canyon alternative. The principal difference in the system designed for Corinda Los Trancos Canyon is that leachate and ground water collected at the toe of the facility must be pumped to the surface for treatment and

disposal (see Section 3.5c). Several water quality impacts could occur as a result of additional landfill construction in Corinda Los Trancos Canyon. These water quality impacts would be similar to those identified for the Apanolio Canyon 1,200-foot alternative, such as increased stream turbidities, and the potential for surface and/or ground-water contamination via leachate migration from the landfill. Failure of the leachate/ground-water pumping system could increase the risk of release of contaminants into the surrounding ground-water resources. Pressures generated by fluid buildup in the landfill's underdrain system could cause a failure of the liner and containment system. Release of contaminants from the landfill would be unlikely; however, a ground-water protection contingency plan would be implemented if degradation of ground-water samples from monitoring wells occurred. This plan would consist of components similar to that proposed for the *applicant's* preferred alternative (e.g., grout curtain cutoff wall and drawdown wells). Implementation of this type of contingency plan would minimize or prevent migration of contaminants downstream.

d. Nuff Canyon

Hydrology

Construction of a landfill in Nuff Canyon would most likely increase the basin's rainfall runoff and the resulting Nuff Creek streamflows. The magnitude of these increases would be dependent upon the size and configuration (e.g., size and location of devegetated areas) of the landfill constructed. For example, assuming that a 117-acre landfill (approximately

17 percent of the basin area) was constructed, and assuming that runoff from the entire landfill was increased by 50 percent, the resulting annual average Nuff Creek streamflows would be increased by approximately 8.5 percent, from 702 acre-feet (0.97 cfs) to 760 acre-feet (1.05 cfs) by project completion.

Associated with the landfill's construction and operation would be an increase in sediment loads into the lower Nuff Creek Basin. The magnitude of the increased sediment loads would be dependent upon the type of erosion control measures implemented and the size and configuration of the landfill.

Water Supply

Uses

The beneficial uses of Nuff Canyon waters (i.e., for wildlife habitat, industrial, agricultural, and potentially domestic) could be adversely impacted by construction and operation of a landfill at this site. Degraded water quality and habitat value may result. Further discussion of impacts to these resources can be found in Section 5.3, Biology.

Water Quality

The potential water quality impacts resulting from construction and operation of a landfill in Nuff Canyon would probably be similar to those associated with the construction of the Apanolio Canyon alternatives. However, the leachate/ground-water management system proposed for this alternative would require leachate and ground water collected at the toe of the landfill to be pumped to the surface for treatment and/or disposal (see Section 3.5d). Although unlikely, failure of this pumping system would

cause increased fluid pressures within and beneath the landfill, increasing the risk of failure of the liner and leachate containment system.

A ground-water protection contingency plan would be implemented in the event that increases in chemical constituents occurred in monitoring wells below the toe of the landfill. This contingency plan would most likely consist of a second grout cutoff wall and drawdown wells downgradient from any contamination front. These actions would minimize or prevent impact to downstream beneficial uses of water resources within the canyon.

e. No Action

The No Action Alternative would eliminate potential hydrology and water quality impacts and the resulting impacts to beneficial uses in the Apanolio Basin. However, an alternative location for waste disposal would be necessary, and similar potential impacts could occur at any site identified for disposal of San Mateo County solid waste.

f. Mitigation Measures

Mitigation Proposed as Part of the Project

- Inspection and maintenance of surface and subsurface water control structures shall be conducted on a programmed basis. Structures to be inspected and maintained shall include:
 - o Retention ponds, diversion ditches, cross-drains, drop inlets, energy dissipators, sedimentation basin, concrete dam and overflow structures.
 - o All flow paths, inlet structures, connections and outlet areas of above structures.
- Annual inspection (including television camera inspection) of structures prior to winter season of all surface and underground storm facilities.

- Inspection of structures shall be conducted annually as defined above, during 5-year engineering review, as well as after: 1) a 50-year or greater storm, 2) any seismic event of greater than 5 Richter magnitude, and 3) any contiguous brush fire greater than 50,000 square feet or where erosion impact would occur in the watershed.
- Maintenance of surface water control structures shall include flushing and/or cleaning of structures as well as any corrective work annually and as needed prior to, during and after storm periods.
- Operator shall inspect and maintain all monitoring wells and report condition to appropriate agencies.
- The quantity and quality of surface waters shall be monitored at designated sample points as set forth by the RWQCB, and appropriate corrective measures shall be taken if necessary.
- The quality of subsurface water shall be monitored by operator at designated ground-water monitoring wells as set forth by an approved monitoring program and sampling protocol with RWQCB.
- Leachate collection facilities (i.e., leachate holding tank) shall be monitored daily for leachate levels and leachate shall be removed by an approved method when the standard capacity level is exceeded.
- Operator shall design a contingency plan for approval by San Mateo County and RWQCB, which will include appropriate trigger mechanisms for implementation of the contingency plan if necessary. This plan shall include provisions for notification of appropriate review and control agencies, repair, and remedial action. *A draft plan is contained in Appendix D.*
- Operator shall predetermine lower aquifer quality and quantity under normal recharge conditions to establish baseline quality and quantity for lower aquifer users prior to project construction.
- *Maintenance of Apanolio Creek summer low flows shall be provided at pre-project conditions through implementation of a streamflow augmentation plan. Water for creek augmentation shall be obtained from ponds to be constructed in Corinda Los Trancos Canyon, wells, and hydraugers. A brief description of the plan is contained in Appendix D.*
- *Recharge of the lower Apanolio Canyon aquifer shall be provided by a series of ground-water injection/recharge wells below the toe of the proposed landfill. A draft recharge plan is provided in Appendix D.*

- Operator shall develop detailed construction, quality control, erosion control, and surface water management plans for review and approval by San Mateo County Department of Public Works and the California Department of Fish and Game.

Mitigations Identified in this Report

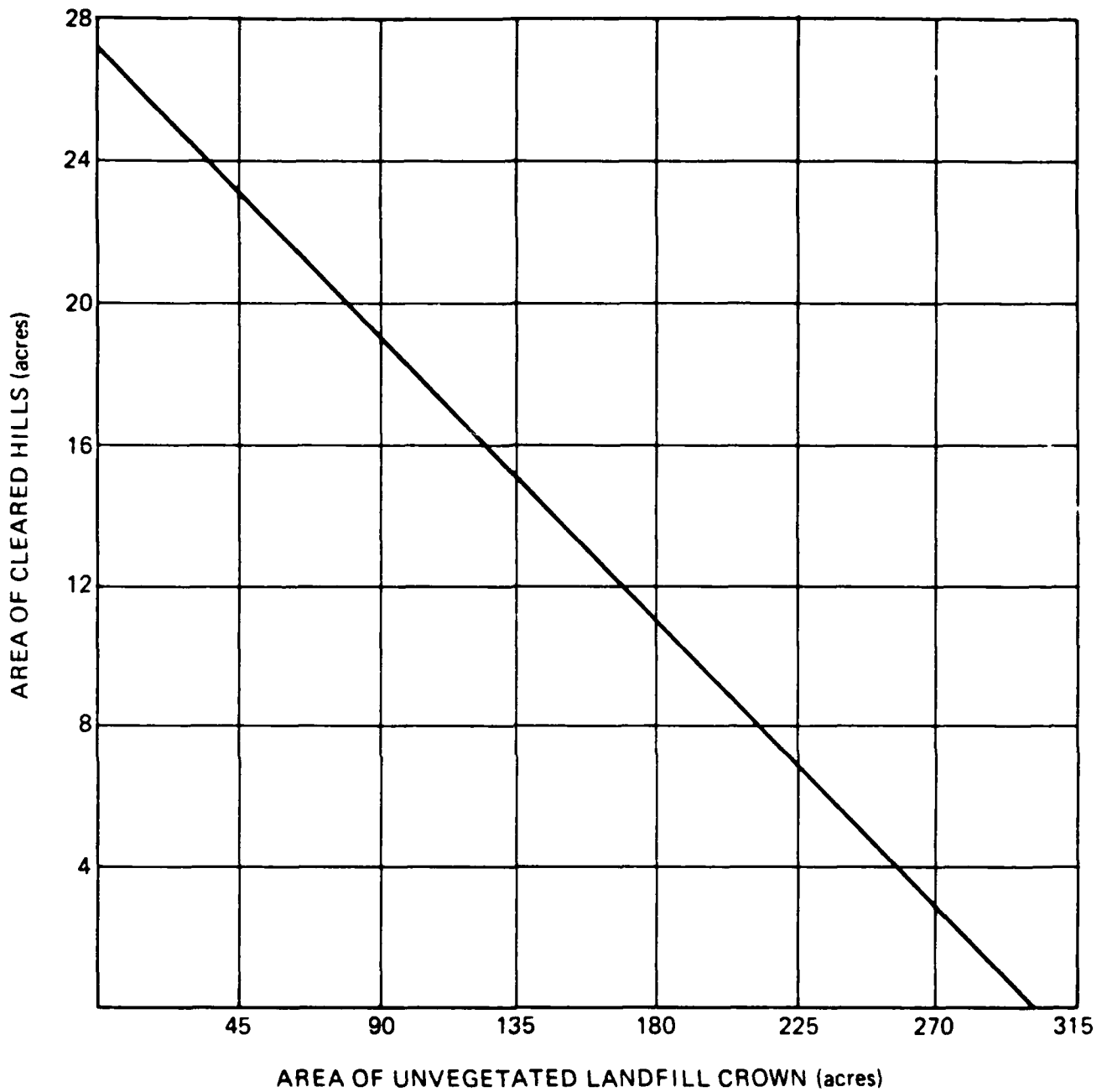
- Restrict the size and duration of unvegetated hill and landfill crown areas, to minimize alteration of the existing streamflow regime and associated streamflow and sediment transport impacts.
- Stabilize all sediments removed from the above basin, either on or away from the project site, to prevent reentry into Apanolio Creek or other drainage systems.
- Divert all stream flow during construction from above disturbed areas to below construction area.
- Development of the landfill should proceed under the land use guidance presented in Figure 5.2-1, unless it can be demonstrated that other land use combinations, not presently identified as suitable combinations, will not increase total sediment loads above baseline conditions. Figure 5.2-1 presents the approximate combinations of cleared (unvegetated) landfill crown and hill areas that would not increase the average sediment load above pre-project levels. These estimated combinations are based on the sediment trap configurations presently proposed.

5.3 Biology

a. Apanolio Canyon - 1,200-foot

Vegetation

Removal of vegetation within Apanolio Canyon would occur gradually throughout the life of the project. Initial construction activities would clear vegetation along the canyon bottom and then during project operation, vegetation removal would continue outward from the center of the canyon in concentric bands about 25 feet high at a rate of about 1 band every 1 to 4 years until the 1,200-foot contour was reached. Until such time as the



Source: Hydrocomp, Inc., 1988.



Harding Lawson Associates
Engineers and Geoscientists

**Maximum Acres of Cleared Hills and Unvegetated
Landfill Crown that will not Exceed Total Sediment Load**
Ox Mountain Sanitary Landfill
Apanolio Canyon Expansion Site EIS
San Mateo County, California

FIGURE

5.2-1

DRAWN
JAS

JOB NUMBER
6234,031.01

APPROVED

DATE
1/88

REVISION

DATE

vegetation is actually removed, local plant communities would remain and would provide habitat for various wildlife species.

Completion of the Apanolio Canyon 1,200-foot landfill would require the permanent removal of approximately 8 to 11 acres of riparian habitat, 43 acres of Douglas fir forest, 2 acres of grassland and 232 acres of coastal scrub and chaparral vegetation (see Table 5.3-1). The original Corps determination was based on the extent of riparian canopy within the affected reach of Apanolio Canyon and thus provides a reasonable estimate of the extent of such habitat in the project area. In the final EIR (Thomas Reid Associates, 1984), the extent of riparian vegetation within the project boundary was determined to be 8 acres. A preliminary wetlands assessment conducted by the Corps designated approximately 11 acres along the stream zone on the site as within Department of the Army jurisdiction (letter from Jack E. Farless to Lino Valbusa dated November 7, 1986). However, upon further review of the field data, mapping procedures, and wetlands parameters, the Corps recalculated its area of jurisdiction in Apanolio Canyon to be 3.43 acres (letter from Andrew M. Perkins, Jr. to Lino Valbusa dated April 24, 1987). For the purposes of this EIS, a range of approximately 8 to 11 acres of riparian vegetation is used to quantify impact to this habitat type as a result of the project.

The loss of vegetation in Apanolio Canyon would be important in a local context because the site currently has high biological diversity and wildlife value due to its remoteness and relative lack of disturbance. In a regional context, the most significant loss would be the riparian and

Table 5.3-1
Comparison of Vegetation Types Removed¹
(Approximate Acreages)

Vegetation Type	Apanolio Canyon 1,200-Foot Project	Apanolio Canyon 850-Foot Project	Corinda Los Trancos Forefill Project	Nuff Canyon Project
Riparian Woodland	8-11	7-10	4-5	5-7
Douglas Fir Forest	43	11	3	29
Grassland	2	2	14	13
Coastal Scrub Chaparral	232	108	61	52
Agricultural	0	0	12	10
Disturbed Open	0	0	3	8
Total	285	128	97	117

¹These acreages were derived from mapping and calculations in the Final EIR (Thomas Reid Associates, 1984), U.S. Army Corps of Engineers information, and recent field information collected by HLA.

aquatic habitats, because these represent diminishing resources of high value in the Bay Area and throughout California.

Though there are several Douglas fir stands within the project boundary, this habitat type is more abundant in the upper end of Apanolio Canyon, above the proposed landfill, and along the ridges within the upper Apanolio Canyon and Pilarcitos watersheds.

Construction of two haul roads connecting the proposed Apanolio Canyon landfill with the existing Corinda Los Trancos facility would also require the removal of predominantly chaparral and coastal scrub vegetation. The lower road would be constructed during site preparations and would be aligned through an area that would eventually become part of the landfill. The upper road would be constructed during the life of the project and though it would not be within the area of fill, it would likely provide permanent access into the facility.

Wildlife

The potential impacts on the resident wildlife in Apanolio Canyon are related to loss of habitat through vegetation removal and the introduction of work crews and heavy equipment into an otherwise isolated environment. Using the 93-year life-span of the project, wildlife habitat would be eliminated at an average rate of 3 acres per year.

During construction activities, small sedentary animals would probably be temporarily displaced. This would decrease local populations but would not have a significant effect on the overall status of these species. Removal of vegetation, initially and through the life of the project, will displace wildlife which currently inhabit the area to adjacent habitat

areas. While mobile wildlife may not be directly destroyed, local populations would probably be reduced as a result of the reduction in habitat within the Apanolio Canyon upper watershed.

Birds which now use the riparian zone along Apanolio Creek for breeding or foraging will have to reestablish territories in the unaffected reaches or in neighboring canyons. The loss of part of upper Apanolio Canyon could result in a diminution in the populations of birds that can be supported in the region.

The secretive, carnivorous mammals that have been observed in the upper canyon would likely be displaced as soon as construction began (Thomas Reid Associates, 1984). Such species are commonly restricted to isolated country where human visits are infrequent or non-existent. Since they would become even more restricted to the still-remote portions of the north San Mateo County coastal watershed, with a limited carrying-capacity, their regional populations may ultimately be reduced.

Possible degradation of water quality in lower Apanolio Creek, resulting from the landfill upstream, could affect wildlife in the area. Systems designed to contain leachate and contaminated seepage water from the landfill should prevent release of these substances downstream. Additionally, water quality in lower Apanolio Creek would be closely monitored.

Aquatic

Construction and operation of the Apanolio Canyon landfill would ultimately eliminate approximately 5,600 linear feet of the existing stream channel (U.S. Army Corps of Engineers, 1987). Associated with the loss of

this stream segment are the elimination of 4,054 feet of habitat currently used by resident rainbow trout, as well as habitats that could, with the elimination of downstream passage barriers, be used by steelhead (CDFG Letter to Gordon Snow, July 7, 1987). *An additional 595 feet of potential resident rainbow trout fishery exists above the 4,054 feet of stream referenced above. This segment of stream has never yielded fish during the surveys conducted by BFI and CDFG (also see letter 34, Chapter 9.0). However, this segment of stream could be accessible to downstream populations and therefore should be considered potential resident rainbow trout habitat. Thus, for the purposes of this EIS, the total length of resident rainbow trout fishery eliminated in Apanolio Creek by the proposed project would be 4,649 feet.*

Project construction and operation may also impact aquatic habitats downstream of the project site (up to approximately 10,660 linear feet of Apanolio Creek stream channel, and under worst case conditions, Pilarcitos Creek, from the confluence of Apanolio Creek to the Pacific Ocean). Both the magnitudes and types of downstream aquatic biological impacts are largely dependent upon the ability, or inability, to maintain existing downstream water quality conditions and flows. Computer simulation results reported by Hydrocomp, Inc., (1988) indicate that project operation could result in a net increase of clay, and possibly silt sediment loads entering Apanolio Creek, downstream of the project area (see Section 5.2). These additional silt and clay sediment loads could indirectly impact resident rainbow and steelhead fish populations via the destruction of food supplies, lowered egg or alevin survival, and/or degradation of rearing habitats

(Reiser and Bjornn, 1979). Erosion and sediment control measures proposed as part of the project are intended to reduce such water quality impacts.

In the unlikely event of failure of the landfill's liner and/or leachate collection and removal system the release of waterborne contaminants into Apanolio Creek and ground-water resources could occur. These contaminants, assuming they entered the creek, could be toxic to aquatic life. The implementation of a water resource protection contingency plan would be triggered if any increase in potentially dangerous contaminants were detected in monitoring wells below the toe of the landfill. This plan would greatly reduce the threat of downstream contamination.

Endangered Species

The various studies conducted in Apanolio Canyon indicate that no impact to any state or federally listed threatened or endangered species would be likely to occur at the site as a result of project development and operation.

Although the project area is within the range of the endangered San Francisco garter snake, reconnaissance of the project site by garter snake experts failed to identify suitable habitat for the species. Trapping surveys *conducted between May 1987 and June 1988 by Dr. Sam McGinnis* failed to capture or observe this species. Because these field surveys have not captured any San Francisco garter snakes, it is unlikely that the project would impact snake individuals or populations. If downstream water resource contamination were to occur in the unlikely event of both failure of the landfill leachate containment system and contingency actions, then impact to potential snake populations could occur. However, there is

currently no evidence that the endangered species occurs in lower Apanolio Canyon.

b. Apanolio Canyon - 850-foot

Vegetation

Impacts on the vegetation in Apanolio Canyon with a reduced fill project would be similar to the applicant's preferred alternative with the exception of removal of canyon vegetation between the 850-foot and 1,200-foot elevations. The 850-foot alternative would also reduce the amount of fill required in riparian and designated wetland areas for completion of the landfill. The riparian area within the 850-foot project was determined to be 7 acres (Thomas Reid Associates, 1984). To determine the area of wetland within the 850-foot project, transect areas in HLA's wetlands assessment (February 1987) that were above the limit of the landfill were totaled. This value (0.7 acre) was subtracted from the designated 3.4 acres of wetland for the 1,200-foot project to give an estimated 2.7 acres of wetland within the 850-foot project boundary. The amount of Douglas fir and coastal scrub vegetation types impacted by the 850-foot project would be significantly less as the elevation of fill is reduced 350 feet (see Table 3.5-1).

Wildlife

The introduction of work crews and heavy equipment into an otherwise isolated environment would also occur with this alternative. Therefore, impacts on the wildlife resulting from this disturbance, as discussed in the previous section, are applicable here.

The reduced area of disturbance under this alternative could result in less of a reduction in local populations of sedentary and mobile wildlife species within Apanolio Canyon.

Aquatic

The aquatic biological impacts resulting from the construction and operation of the 850-foot perimeter elevation landfill are essentially the same as those associated with the construction and operation of the 1,200-foot perimeter elevation landfill.

Endangered Species

As with the 1,200-foot Apanolio Canyon alternative, the reduced fill alternative would not be expected to impact any listed threatened or endangered invertebrate, plant, or animal species.

c. Corinda Los Trancos Canyon - Forefill

Vegetation

Impacts on the vegetation in Corinda Los Trancos resulting from a forefill project would be similar in nature to those described for Apanolio Canyon. Removal of vegetation would be gradual over the life of the project with an initial clearing of the canyon floor during site preparation. The ultimate result would be the loss of approximately 97 acres of vegetation (see Table 5.3-1).

Because Corinda Los Trancos has a long history of human disturbance, the vegetation lost within the canyon bottom would consist primarily of non-native agricultural species and grassland. The slopes of the canyon are dominated by coastal scrub vegetation with some scattered Douglas fir stands

but do not support the diversity or density of vegetation found within Apanolio Canyon.

The riparian corridor is locally extensive along the creek, particularly in the lower reaches. Though dense in some areas, the riparian community within the Corinda Los Trancos forefill project does not provide the same habitat values associated with Apanolio and Nuff Creeks.

An assessment of the extent of riparian vegetation within the forefill project was based on assumptions derived through review of existing information, aerial photographs, and measurements taken in the field. Assuming a corridor width of 50 to 70 feet, there are approximately 4 to 5 acres of riparian vegetation within the project boundary. *Using the data collected and evaluated through the wetlands assessment for the site, approximately 0.89 acre of this stream channel habitat could be classified as "waters and adjacent wetlands" under Corps' jurisdiction.*

Wildlife

Animals using the forefill area habitat would be displaced to surrounding, less disturbed areas. Since the vegetation loss would be gradual, many species would move upslope as the fill encroaches on their habitat. Loss of sedentary animals is likely but probably would not result in a significant impact on the species as a whole.

Wildlife associated with the riparian areas would have to relocate to unaffected reaches of the creek or neighboring canyons.

Aquatic

Construction and operation of a landfill facility in the forefill area would require the filling of up to 3,400 linear feet of Corinda Los Trancos

stream habitat and about 0.6 acre of existing sedimentation basins. These habitats would be permanently eliminated.

Both the magnitudes and types of downstream aquatic biological impacts would be dependent upon the actual landfill size, design, and operating policies implemented.

Potential impacts include the degradation or loss of aquatic habitats, and loss of associated organisms, through the degradation of water quality conditions (e.g., increased turbidity, stream temperatures, and/or possible presence of contaminants from landfill leachate), and/or the alteration of Corinda Los Trancos streamflow regimes (e.g., magnitude and duration of high flow events), and, in turn, stream channel morphology.

Endangered Species

As with the Apanolio Canyon alternatives, a forefill project in Corinda Los Trancos Canyon would not be expected to impact any listed threatened or endangered invertebrate, plant, or animal species.

d. Nuff Canyon

Vegetation

As with the Apanolio Canyon alternative, the establishment of a landfill in Nuff Canyon would impact existing vegetation in two stages. The initial stage would eliminate the vegetation along Nuff Creek and the canyon floor, followed by a gradual clearing of vegetation from the canyon walls as the elevation of the fill progressed upward. The estimated amounts of vegetation types that would ultimately be removed for the Nuff Canyon project are presented in Table 5.3-1. A total of 117 acres of vegetation would be removed once the project was complete.

Using assumptions for the average width of the riparian corridor associated with Nuff Creek (i.e., 20 to 30 feet) an estimated 5 to 7 acres of riparian community would be eliminated by a project in Nuff Canyon. Based on data collected during the field investigation of the site and assumptions made regarding width of the wetland corridor along drainages in the northern portion of the project site, 1.74 acres of this riparian community could be considered "waters and adjacent wetlands."

Wildlife

Removal of habitat within Nuff Canyon would displace wildlife to adjacent areas. However, as with all previously described alternatives, vegetation removal would be gradual throughout the life of the project. Impacts to wildlife would be very similar to the Apanolio Canyon 1,200-foot alternative, except that construction and operation of the project would occur in a canyon that has been influenced by a history of homesteading and grazing.

Aquatic

Construction and operation of a landfill facility in Nuff Canyon could require the filling of up to 4,200 linear feet of Nuff Creek stream habitat. This habitat would be permanently eliminated; however, since Nuff Creek does not appear to support a resident fish population nor does it provide anadromous fish habitat, impacts to fishery resources would probably not occur.

Both the magnitudes and types of downstream aquatic biological impacts would be dependent upon the actual landfill size, design, and operating policies implemented.

Potential impacts include the degradation or loss of aquatic habitats, and loss of associated organisms, through the degradation of water quality conditions (e.g., increased turbidity, stream temperatures, and/or possible presence of chemical contaminants from landfill leachate), and/or the alteration of Nuff Creek streamflow regimes (e.g., magnitude and duration of high flow events), and, in turn, stream channel morphology.

Endangered Species

As with the Apanolio Canyon alternatives, a project in Nuff Canyon would not be expected to impact any listed threatened or endangered invertebrate, plant, or animal species. Certain candidate or sensitive species may occur in project vicinity and could be affected either directly or indirectly by construction and operation of the project.

e. No Action

The No Action Alternative would result from denial of the Corps permit for placement of fill in Apanolio Creek and adjacent wetlands. Under this alternative, impacts to wetlands and other vegetative habitats, wildlife, and fisheries resulting from the applicant's preferred alternative would not occur.

Identification of an alternative landfill site within or outside San Mateo County would likely result in impacts to vegetation, fish, and wildlife resources; however, until such a site is identified, the magnitude of these impacts cannot be determined.

f. Mitigation Measures

A mitigation plan has been developed for the Apanolio Canyon 1,200-foot project by Ralph Osterling Consultants for BFI (1989). The plan has been

reviewed and conceptually agreed to by the California Department of Fish and Game (letter to Ralph Osterling from Ted Wooster, CDFG, dated January 22, 1988).

The plan proposes various programs to increase the amount of steelhead trout use in unaffected reaches of *Corinda Los Trancos*, *Pilarcitos*, *Arroyo Leon*, and *San Pedro* creeks. In summary, the proposed mitigation would provide enhanced steelhead migration access to 7,800 feet of *Corinda Los Trancos Creek*, 18,000 feet in both *Pilarcitos* and *Arroyo Leon* Creeks, and 7,200 feet in *San Pedro Creek*. Improvement of fishery habitat through stream bank plantings is also proposed.

Vegetation and wildlife habitat losses will be mitigated through establishment of new and enhancement of existing areas. Wetland and riparian vegetation plantings are planned for several existing and created water features. Development of springs for wildlife watering areas, prescribed burns to remove over-mature scrub vegetation, and revegetation of completed landfill slopes, are also components of the proposed mitigation plan.

Though this plan was developed specifically for the preferred alternative, many of its components are applicable to the *Corinda Los Trancos Forefill* and *Nuff Canyon* alternatives. More detailed descriptions for each of the projects are being developed by BFI, and each will be approved by CDFG. Establishment of riparian habitat and instream improvements along the unaffected reaches of the creeks should be considered for all of the proposed alternatives.

The proposed plan is summarized below and is provided in its entirety in Appendix B.

Fisheries

- Fish jump pools will be constructed in Pilarcitos Creek at the existing migration barrier located downstream from the Highway 92 bridge crossing over the creek. This barrier is a concrete structure which prevents upstream access to 18,000 feet of stream for steelhead during low flow conditions. Jump pools will allow consistent fish passage during these low flow conditions.
- Instream fishery habitat improvement structures, consisting of 15 or more weirs or shallow falls, will be constructed in the undisturbed portions of Apanolio Creek on BFI property. These structures will be installed between the southern BFI property boundary and the proposed sediment basin and are designed to create pool habitat by concentrating streamflow to the center of the creek and scouring out 6-inch to 12-inch deep pools below the structure.
- Fish jump pools will be constructed at an existing barrier to upstream migration on Arroyo Leon Creek. Low winter flows prevent access to approximately 18,000 feet of fishery habitat within the creek. This mitigation will allow consistent winter access.
- Concrete flow deflectors will be installed where San Pedro Creek flows through a smooth concrete channel at the Adobe Street bridge in the City of Pacifica. Currently during low flow conditions, water depths are too shallow to allow passage of migrating fish. Flow deflectors will be designed to concentrate low flows and allow consistent access to an additional 7,200 feet of fishery habitat in San Pedro Creek.
- *Stream improvement projects will be conducted in Corinda Los Trancos Creek. These improvements will include streambank stabilization, instream fishery improvements, placement of spawning gravels, fencing to prevent access by cattle, streambank revegetation, and sediment management. In addition, streamflow in Corinda Los Trancos Creek will be augmented. The minimum augmentation during low flow periods will be 5 gallons per minute. The amount of augmentation will be based upon estimated natural flows for specified segments of Apanolio Creek.*

Vegetation and Wildlife

- Establishment of riparian vegetation will be undertaken along 1,600 feet of Pilarcitos Creek. *The two areas to be revegetated are currently degraded in and around the stream channel. Willow species will be planted to reestablish riparian/wetland habitat as well as increase the value of the wildlife and fishery resources along these reaches.*

- One to 1.5 acres of riparian/wetland habitat will be reestablished around the perimeter of the proposed sediment basin for the Apanolio Canyon landfill. This planting will occur 3-5 years after construction activities begin when thorough cleaning of the sediment basin is less frequently required.
- Prescribed burns will be conducted on noncontiguous areas to remove over-mature coastal scrub and chaparral habitat and reestablish diversity of the brush fields. These burns will occur on BFI property in Apanolio Canyon and adjacent areas on a continuous, rotating cycle and will allow reburning every 10 to 15 years. The program will develop areas of young, old, and intermediate aged vegetation, providing a diverse habitat for all upland wildlife species.
- Douglas-fir seedlings will be planted on 43 acres of previously disturbed area.
- Naturally occurring springs will be located outside the Apanolio and Corinda Los Trancos watersheds and developed to provide perennial water sources for upland wildlife. Development will consist of drilling horizontal wells to intercept subsurface and near surface flows and divert these flows to small water pools. In addition, a one acre wildlife pond will be constructed on the ridge below Scrapers Peak. Riparian/wetland plant species will be planted around the perimeter of the pond, creating 10 acres of riparian/wetland habitat.
- Grassland habitat, consisting of annual and perennial grasses, forbs and legumes, will be established on finished areas as the landfill is constructed. The seeding will establish a cover crop to control soil erosion and provide food and cover for birds and small mammals. In addition, brush piles will be selectively placed within these grassland areas to provide wildlife cover.
- Enhancement of the riparian/wetland habitat around an existing pond above the Corinda Los Trancos landfill will be achieved through planting of selected riparian/wetland species. *One-quarter (0.25) acre of riparian/wetland habitat will be created.*
- Ceanothus shrubs will be planted on the western side of the 1,500-foot concrete lined drainage channel that conveys water from the pond above the landfill. These shrubs will shade the channel and provide water temperature modification and wildlife habitat.

- Water storage ponds will be constructed downstream from the existing landfill in Corinda Los Trancos Canyon. Two ponds will be constructed to provide water for augmentation of Apanollo Creek flows.
- Riparian/wetland corridors will be developed in Corinda Los Trancos Canyon. Eight riparian/wetland corridors will be established for a total creation of 11.3 acres of riparian/wetland habitat.
- Enhancement of two existing sediment ponds and 600 feet of stream channel immediately below the Corinda Los Trancos landfill will be conducted. These areas are currently surrounded by Eucalyptus globulus. The eucalyptus will be removed and replaced with native alders and willows.
- Conservation and wildlife easement will be established in Corinda Los Trancos Canyon upon completion of mitigation programs in this drainage. This easement will include the riparian corridors created, stream channel and associated riparian/wetland development.

Sediment Control Structure Maintenance

- Sediment control basin below the proposed landfill will be maintained properly to ensure adequate sediment holding capacity to retain sediments suspended in runoff flows. Access points for cleanout activities will be limited to minimize disturbance of wetland vegetation around the pond's perimeter.

Monitoring/Maintenance

- The mitigation program will be evaluated and monitored for 5 years to determine whether the requirement of no net loss of acres or habitat has been achieved.

Financial Responsibility

- Costs of installing, maintaining, operating, and replacing all wildlife compensation projects for the life of the landfill project will be provided by BFI.

- Establishment of a BFI corporate guarantee to ensure the effectiveness of the proposed mitigation has been requested by CDFG and will be provided. These monies will be available to correct any failed or inadequate mitigation as identified by CDFG. *As each mitigation project is completed and its effectiveness verified, BFI will be relieved of further responsibility beyond maintenance of that project.*

5.4 Transportation

a. Apanolio Canyon - 1,200-foot

The 1987 and future traffic volumes to the Ox Mountain Sanitary Landfill are presented in Table 5.4-1. These traffic numbers assume a one percent increase per year in solid waste volumes to be disposed of at the Ox Mountain facility. This annual increase in solid waste volume is assumed until the year 2010.

Table 5.4-1. Estimated Weekday Traffic to Ox Mountain Sanitary Landfill¹

Year	<u>From East of Coast Range</u>			<u>From West of Coast Range</u>		
	<u>Transfer Trucks</u>	<u>Packer Trucks²</u>	<u>Other Vehicles</u>	<u>Transfer Trucks</u>	<u>Packer Trucks²</u>	<u>Other Vehicles</u>
1987	90	5	70	10	11	52
1990	93	5	72	10	11	54
2000	103	6	80	11	12	60
2010	114	7	88	12	13	66
2020	114	7	88	12	13	66

Assumptions: Increase in solid waste production at a rate of 1 percent per year until 2010.

¹ Numbers represent vehicle round trips.

² Includes roll-off container trucks.

Source: Browning-Ferris Industries of California, Inc.

Level of Service Impacts

Volume/Capacity (V/C) ratio and Level of Service (LOS) impacts of the proposed project were analyzed by converting future passenger car and truck volumes into passenger car equivalents. Based on observed truck performance over Highway 92, fully loaded transfer trucks were determined to be equivalent to 20 passenger cars and empty transfer trucks were assumed to be equivalent to four passenger cars. Transfer truck traffic between 11 a.m. and 12 noon is assumed to constitute one-sixth of the average weekday volume associated with the landfill (Thomas Reid Associates, 1986).

Increases in future traffic volumes were estimated based on historical trends and on land use projections for the Half Moon Bay area. Between the years 1972 and 1982, traffic volume on Highway 92 increased at an average rate of approximately 2.4 percent per year. Existing growth in traffic on Highway 92 was assumed to continue at this rate until the year 2000, when it was assumed to begin increasing at one percent per year. This assumption is based on a leveling off of population growth by this year as projected by the Association of Bay Area Governments.

The impacts of the traffic generated by the proposed project are presented for westbound and eastbound lanes in Table 5.4-2 and Table 5.4-3, respectively. Data presented in these tables includes pce, V/C ratio, and LOS with and without the proposed project for three time periods and three future years (1990, 2000, and 2010). The V/C ratios and LOSs calculated assume that truck climbing lanes on Highway 92 between I-280 and the landfill are in place by 1995. These improvements are assumed to increase the capacity of the roadway from 1,400 pce per hour to approximately 2,400 pce per hour in each direction along the up and downhill segments.

Table 5.4-2. Traffic Impact on Westbound Highway 92
between I-280 and Landfill

<u>Year</u>	<u>Time of Day</u>		
	<u>7:00 - 8:00 a.m.</u>	<u>11:00 a.m. - 12:00 noon</u>	<u>5:00 - 6:00 p.m.</u>
<u>1987</u>			
Ox Mountain (pce)	7	307	7
All (pce)	698	1,018	1,221
V/C	0.50	0.73	0.87
LOS	D	E	E
LOS	D	D	E
<u>1990</u>			
Ox Mountain (pce)	7	327	7
All (pce)	750	1,088	1,311
V/C	0.54	0.78	0.94
LOS	D	E	E
LOS (w/o project)	D	D	E
<u>2000</u>			
Ox Mountain (pce)	8	349	8
All (pce)	950	1,316	1,662
V/C ¹	0.39	0.55	0.69
LOS ¹	C	D	E
LOS (w/o project) ¹	C	D	E
V/C ²	0.68	0.94	1.19
LOS ²	E	E	F
LOS (w/o project) ²	E	E	F
<u>2010</u>			
Ox Mountain (pce)	9	390	9
All (pce)	1,049	1,453	1,836
V/C ¹	0.44	0.61	0.77
LOS ¹	D	E	E
LOS (w/o project) ¹	D	D	E
V/C ²	0.75	1.04	1.31
LOS ²	E	F	F
LOS (w/o project) ²	E	E	F

pce - passenger car equivalence
V/C - Volume/Capacity ratio
LOS - Level of Service

¹ V/C ratio and LOS values assume that truck climbing lanes are in place.

² V/C ratio and LOS values assume no improvements to Highway 92, i.e., capacity remains at 1,400 pce per hour.

Assumptions: All traffic = project traffic and traffic from all other sources; existing capacity = 1,400 pce per hour; future capacity (1995 and beyond) = 2,400 pce per hour.

- pce = 10 packer trucks loaded
- pce = 20 (all buses and 3-axle or greater trucks)
- pce = 4 (all empty transfer trucks and other empty trucks)
- Westbound transfer trucks are loaded
- Other truck traffic 50/50 empty/loaded
- 1/6 of daily transfer truck traffic is between 11 a.m. and 12 noon
- Other landfill traffic is evenly distributed to 10-hour operating day
- Traffic volume increases 2.4 percent per year until the year 2000, when it will increase at 1.0 percent per year.

Source: Caltrans, District 4, 1987. Vehicle Counts Highway 92, September 2, 1987. Calculations performed by HLA.

Table 5.4-3. Traffic Impact on Eastbound Highway 92
between Landfill and I-280

<u>Year</u>	<u>Time of Day</u>		
	<u>7:00 - 8:00 a.m.</u>	<u>11:00 a.m. - 12:00 noon</u>	<u>5:00 - 6:00 p.m.</u>
<u>1987</u>			
Ox Mountain (pce)	7	67	7
All (pce)	1,535	795	644
V/C	1.1	0.57	0.46
LOS	F	D	D
LOS (w/o project)	F	D	D
<u>1990</u>			
Ox Mountain (pce)	7	71	7
All (pce)	1,648	854	691
V/C	1.18	0.61	0.49
LOS	F	E	D
LOS (w/o project)	F	D	D
<u>2000</u>			
Ox Mountain (pce)	8	77	8
All (pce)	2,089	1,064	876
V/C ¹	0.87	0.44	0.37
LOS ¹	E	D	C
LOS (w/o project) ¹	E	D	C
V/C ²	1.49	0.76	0.63
LOS ²	F	E	E
LOS (w/o project) ²	F	E	E
<u>2010</u>			
Ox Mountain (pce)	9	87	9
All (pce)	2,308	1,180	990
V/C ¹	0.961	0.49	0.41
LOS ¹	E	D	D
LOS (w/o project) ¹	E	D	D
V/C ²	1.65	0.84	0.71
LOS ²	F	E	E
LOS (w/o project) ²	F	E	E

pce - passenger car equivalence
V/C - Volume/Capacity ratio
LOS - Level of Service

¹ V/C ratio and LOS values assume that truck climbing lanes are in place.

² V/C ratio and LOS values assume no improvements to Highway 92, i.e., capacity remains at 1,400 pce per hour.

Assumptions: All traffic = project traffic and traffic from all other sources; existing capacity = 1,400 pce per hour; future capacity (1995 and beyond) = 2,400 pce per hour.

- pce = 10 packer trucks loaded
- pce = 20 (all buses and 3-axle or greater trucks)
- pce = 4 (all empty transfer trucks and other empty trucks)
- Eastbound transfer trucks are empty
- Other truck traffic 50/50 empty/loaded
- 1/6 of daily transfer truck traffic is between 11 a.m. and 12 noon
- Other landfill traffic is evenly distributed to 10-hour operating day
- Traffic volume increases 2.4 percent per year until the year 2000, when it will increase at 1.0 percent per year.

Source: Caltrans, District 4, 1987. Vehicle Counts Highway 92, September 2, 1987. Calculations performed by HLA.

As indicated by Table 5.4-2, the westbound Highway 92 traffic to Ox Mountain accounts for approximately 30 percent of the pce volume during the 11:00 a.m. - 12:00 noon period. Based on the assumptions made in LOS calculation, the landfill traffic caused a shift in LOS from D to E in 1987. A similar shift in LOS is estimated for 1990 and 2010. During the other time periods presented, Ox Mountain traffic constitutes less than 1 percent of the pce volume. The heaviest traffic period on westbound Highway 92 occurs during the evening commute as indicated in the 5:00 p.m. - 6:00 p.m. time period. During this time period in 1987, the roadway was operating at approximately LOS E, with Ox Mountain traffic contributing less than 1 percent of the pce volume. Roadway improvements in the uphill and

downhill sections of Highway 92 between I-280 and the landfill, assumed to be in place by 1995, improve the projected LOS for westbound lanes. The LOS for westbound lanes between 7:00 and 8:00 a.m. improves to LOS C in 1995 (i.e., year 2000 in Table 5.4-2) and then deteriorates to LOS D between 2000 and 2010. Landfill traffic causes an increase in the LOS for westbound lanes from D to E only during the 11:00 a.m. and 12:00 noon time for 1990 and 2010.

Eastbound traffic is less impacted by landfill vehicles, primarily because transfer trucks traveling in this direction are empty, causing less traffic congestion. The heaviest traffic periods are during the morning commute hours, indicated by the 7:00 a.m. - 8:00 a.m. period in Table 5.4-3. In 1987, the LOS for eastbound Highway 92 was F. During this commute period, traffic impacts are probably caused almost entirely by heavy automobile traffic volumes. Planned improvements are anticipated to improve LOS conditions to E after 1995. Ox Mountain traffic has little effect on traffic service levels in the eastbound direction. Projected traffic volumes between 11:00 a.m. and 12:00 noon for 1990 indicate that landfill traffic increases the eastbound LOS from D to E. No other landfill caused changes in LOS are anticipated.

Traffic Delay

Assuming an average of one fully loaded transfer truck traveling on westbound Highway 92 every four minutes during the midday in 1990, approximately 75 percent of all westbound traffic would experience some delay due to transfer trucks if no roadway improvements were provided. The

maximum delay experienced would be approximately three minutes. If the climbing lanes are provided, transfer truck caused delays would be limited to the one lane downhill sections where the trucks travel nearly as fast as passenger car vehicles (Thomas Reid Associates, 1984).

Safety

The additional truck trips on Highway 92 generated by the Apanolio Canyon landfill site may increase the potential for accidents on Highway 92 on a per mile basis. The most directly impacted location would probably be the intersection of Highway 92 with the Ox Mountain access road, where increased turning movements across Highway 92 would likely increase the number of conflicts between through and turning vehicles. As future traffic volumes on Highway 92 increase, left turns from the Ox Mountain access road onto eastbound Highway 92 would require a slightly longer wait for the sufficiently long gaps in both directions of traffic to appear.

Other safety concerns include the steep grades of Highway 92, where slow moving truck traffic may promote unsafe passing attempts by other trucks as well as by passenger vehicles, and where trucks with mechanical problems would be most susceptible to accidents.

b. Apanolio Canyon - 850-foot

The traffic impacts resulting from this project alternative would be similar to the 1,200-foot alternative. The Ox Mountain Sanitary Landfill would continue to be the County's primary landfill for an estimated 25 years. Therefore, traffic impacts related to this project would be the same as those for the *applicant's* preferred alternative, until the

capacity of the landfill was reached. When the landfill capacity was reached, the County would then establish another disposal site. If the Ox Mountain Sanitary Landfill was not used as the new disposal site, then truck and automobile traffic to the site would be diverted to a different disposal site location.

c. Corinda Los Trancos Canyon (Forefill)

Traffic impacts would be the same as those for the Apanolio Canyon 850-foot alternative, but for a shorter period of time. The landfill life-span under this alternative is 16 years.

d. Nuff Canyon

Landfill truck traffic volumes and impacts along Highway 92 would be similar to the Apanolio Canyon 1,200-foot alternative. The primary difference between this alternative and the Apanolio Canyon alternative is the relocation of the landfill access road to the existing quarry road approximately 1.2 miles east of the current landfill entrance. Relocation of this access road creates potential truck traffic compatibility problems between the quarry trucks and transfer trucks traveling to and from the landfill. The anticipated life-span of this alternative is 27 years, approximately 66 years less than the *applicant's* preferred alternative.

An average of 100 transfer truck trips per day and 83 quarry truck trips per day (during peak quarry operating season) would require access to Nuff Canyon via the existing access road. Assuming an operational period of 8:00 a.m. to 4:00 p.m. for both operations, and distributing trips evenly throughout this period, approximately 23 trucks would be turning onto and from the access road per hour. Quarry operations would potentially be

hindered because of the volume of truck traffic using the access road through the quarry to the landfill site.

Increases in both transfer truck and private vehicle traffic volumes within the area of the active quarry would increase the potential for vehicle accidents. Additional turning at the access road/Highway 92 intersection also may increase potential for traffic accidents. The elimination of truck turns from and onto Highway 92 at the existing Ox Mountain Sanitary Landfill access road could offset a portion of these potential intersection impacts. The relatively straight segments of Highway 92 in the vicinity of the quarry access road would allow greater sight distances for motorists than do road conditions near the current landfill access.

e. No Action

No action at Ox Mountain Ranch would divert future (1989 and beyond) truck traffic to another location either within or outside San Mateo County. These trips would originate at the four transfer stations existing in the County. In 1990, an estimated 103 transfer truck, 16 packer truck, and 126 private vehicle trips each weekday would be diverted to an alternate site. Depending on landfill location, the automobile and packer truck traffic currently delivering refuse directly to Ox Mountain could be diverted to the nearest transfer station, increasing the number of daily transfer truck trips. Distribution of these trips is unknown pending site identification.

If Highway 92 were not used for transfer truck traffic, the current traffic impacts resulting from transfer trucks would be alleviated.

Reduction of truck traffic on this highway would reduce delays caused by truck traffic and increase the efficiency of traffic flow. Similar traffic impacts could be realized along transportation routes to the new disposal site.

Use of resource recovery would reduce the volume of truck traffic to the selected landfill location. If a centrally located facility was constructed, the current volume of truck traffic would be diverted to the facility with a reduced volume of truck trips from the facility to the landfill.

f. Mitigation Measures

Mitigations Common to All Alternatives

- Provide a truck turnout area at the summit of Highway 92 near Skyline Boulevard to allow trucks to pull off the roadway. A turnout would allow other vehicles to pass the loaded trucks and would allow trucks to regain forward momentum with the help of a downhill slope.
- Improve signage and intersection warning devices (e.g., truck crossing, truck turning) along Highway 92 near the sanitary landfill access road.
- Continue to enforce traffic restrictions outlined in the County's use permit for the facility. These restrictions, preventing eastbound trucks from leaving the landfill between 7:00 a.m. and 8:00 a.m., prevent landfill truck traffic from impacting morning commute traffic.
- Ox Mountain/Highway 92 intersection improvements should be implemented, consisting of the following:
 - o Install a longer, separately striped westbound deceleration/right turn lane.
 - o Eastbound shadow/acceleration lane just east of the access road to enable vehicles to enter Route 92 whenever a westbound traffic gap is available.

- o Widen the exit roadway from the landfill to facilitate separate right and left-turn exiting movements.

Nuff Canyon

- Improve the Nuff Canyon access road/Highway 92 intersection. Improvements could include widening of access road and/or installation of a traffic signal to facilitate truck and private vehicle turning from and onto Highway 92. Or, alternatively, establish an access route into Nuff Canyon from the existing Corinda Los Trancos Canyon landfill. This would avoid any safety or congestion problems that may result from a combined quarry/landfill access route in Nuff Canyon.

5.5 Air Quality

a. Apanolio Canyon - 1,200-foot

Landfill Gases

Methane generated from decomposition of waste at the proposed landfill could present a potential risk of fire or explosion. Additionally, the landfill would contribute methane and other hydrocarbons to the atmosphere.

The proposed project would accept approximately 673,000 tons of refuse per year. At this rate, the landfill would exceed 1 million tons of waste during the second year of operation. Therefore, according to regulations of the BAAQMD (Regulation 8, Rule 34), a methane recovery system would be required. This system when in place would reduce fire risk and control hydrocarbon emissions.

Odorous gases generated by the landfill could present a nuisance to landfill employees and the public. Odors may be discernible to employees at the site and to private citizens using the landfill facilities. During down-canyon wind conditions, odors may be detectable by receptors in southern Apanolio Canyon. However, because of the distance of these

receptors from the landfill and the lack of odor complaints from the existing Corinda Los Trancos Canyon landfill, odor problems would likely be minor.

Fugitive Dust

Soil samples collected from the Corinda Los Trancos Canyon landfill area contained from 7 to 17 percent silt (Thomas Reid Associates, 1984). The low silt content indicates that dust generation potential from these soils is low. Silt content in Apanolio Canyon soils is expected to be similar to those from the Corinda Los Trancos Canyon landfill; therefore, dust generation potential for the project is expected to be low (Thomas Reid Associates, 1984). Thomas Reid Associates (1984) estimates that construction activities at the project site would generate approximately 5,450 pounds of particulates per day (based on an assumed area of construction activity of 50 acres at any one time, and an emission rate of 1.2 tons of particulates per acre per month).

Fugitive dust generation could pose a potential nuisance and health hazard. Landfill employees and private citizens using the landfill facilities would be impacted by these emissions. During conditions of down-canyon winds, dust could be driven in a southerly direction toward the residences in the southern portion of Apanolio Canyon. However, except during temperature inversion conditions, down-canyon winds would generally occur in afternoon and nighttime periods when dust generation at the site would be low. Due to the low dust generation potential of the soils and the distance from the landfill to the residences, potential for impact to local residents is minimal.

Vehicle Emissions

Vehicle emissions from transportation of refuse to the site would far exceed the emissions from vehicles handling refuse at the site. Thomas Reid Associates (1984) estimated the number of vehicle trips per day that would be generated by the project. They projected that the project would generate 238 round trips per weekday in 1990, 287 round trips per weekday in 2000, and 321 round trips per weekday in 2010. They further estimated that 36 to 40 percent of the trips would be transfer trucks, 9 percent would be diesel powered collection trucks, and 51 to 55 percent would be private vehicles. The average round trip distance was assumed to be 30 miles. Based on updated information provided by BFI, the number of round trips per weekday to the landfill in 1990 is estimated to be 245, increasing to 272 in 2000, and to 300 round trips in 2010. The relative mix of vehicle types has not changed from those presented in the 1984 EIR. Therefore, emissions generated by the vehicles traveling to and from the landfill were adjusted proportionally to the increase in projected round trips, and are shown in Table 5.5-1. Table 5.5-2 lists the total emissions in the Bay Area by major source category in 1990 and the percent contribution by the proposed project.

Table 5.5-1. Weekday Pollutant Emission Levels for Refuse Transportation
(pounds per day)

	<u>Year 1990</u>	<u>Year 2000</u>	<u>Year 2010¹</u>
Carbon monoxide	98.6	88.7	97.7
Hydrocarbons	17.9	17.6	19.6
Nitrous oxides	150.8	147.7	162.6
Sulfur oxides	24.0	29.6	32.6
Particulates ²	17.6	18.2	19.9

¹ Calculations for year 2010 used EMFAC6C emission factors for the year 2000.

² Does not include tire wear on highway, or dust from landfill operations.

Source: San Mateo County traffic projections, EMFAC6C, TRA calculations, adjustments by HLA.

Table 5.5-2. Bay Area Total Emission Levels and Project Contribution
(1990)

<u>Emission</u>	<u>Bay Area Total (tons/day)</u>	<u>Project Contribution (% of Total)</u>
Carbon monoxide	2,250	0.00219
Hydrocarbons	569	0.00157
Nitrous oxides	610	0.01236
Sulfur oxides	233	0.00052
Particulate matter	649	0.00136

Source: Thomas Reid Associates (1984), calculations adjusted by HLA.

Traffic delays created by refuse transport vehicles may indirectly increase vehicle emissions. Slow moving transfer trucks can slow traffic speeds on Highway 92. Slower traffic creates higher vehicle emission

levels. Thomas Reid Associates (1984) estimated this indirect impact to be about 1/3 of the direct impact from vehicles transporting refuse.

b. Apanolio Canyon - 850-foot

The impacts associated with this alternative would be similar to those of the 1,200-foot alternative except that the life of the landfill and associated impacts would be about 68 years less under this alternative.

c. Corinda Los Trancos Canyon - Forefill

Impacts under this alternative would be similar to the 1,200-foot *Apanolio Canyon* alternative. However, no sensitive receptors are located in Corinda Los Trancos Canyon. The closest off-site receptors are near the intersection of the landfill access road and Highway 92 and in Apanolio Canyon, west of the proposed site. The life of the landfill and associated impacts would be about 77 years less under this alternative.

d. Nuff Canyon

Impacts to air quality under this alternative would be similar to that of the *proposed Apanolio Canyon* alternative. However, no permanent residences are located in Nuff Canyon. A cabin is located below the quarry operation, and several residences and businesses are present near Highway 92. Dust and odor may be detectable at the quarry, particularly during daytime, down-canyon wind conditions.

e. No Action

The No Action Alternative would eliminate air quality impacts from the proposed project. It would be necessary to select an alternate site, either elsewhere in the County or outside the County. Similar air quality impacts would be shifted to the new site.

f. Mitigation Measures

- The applicant shall comply with BAAQMD regulations for implementation of a methane recovery system.
- Refuse shall be compacted daily and if necessary (as determined by the San Mateo County Office of Environmental Health), the refuse will be covered daily with soil.
- Haul roads shall be watered during periods of high dust generation such as summer and early fall.

5.6 Noise

a. Apanolio Canyon - 1,200-foot

Traffic Noise

The traffic generated by the proposed project would slightly increase the CNEL from traffic on Highway 92. Estimates of the CNEL for the Highway 92 corridor with and without the proposed project are presented in Table 5.6-1. Projections for traffic volume increases on Highway 92 assumed 2.4% annual increase until 2000 and a 1% annual increase from 2000 to 2010.(see Section 5.4 Transportation)

As indicated in Table 5.6-1, CNELs would increase only 0.5 dBA on Highway 92 to the east of the access road and 0.3 dBA to the west of the access road. These CNELs represent changes in the noise environment that would probably be indistinguishable to even the most sensitive receptors (Thomas Reid Associates, 1984).

Table 5.6-1. Estimated CNELs for Highway 92 Corridor
in the Project Vicinity

<u>Year</u>	<u>East of Access</u>		<u>West of Access</u>	
	<u>Project</u>	<u>No Project</u>	<u>Project</u>	<u>No Project</u>
1990	68.2	67.7	66.3	66.0
2000	69.2	68.7	67.4	67.1
2010	69.6	69.2	67.8	67.5
Existing	67.2		65.6	

Source: Thomas Reid Associates, 1984.

Construction Noise

Project construction would include establishment of an access road between Corinda Los Trancos Canyon and Apanolio Canyon, clearing of trees and other vegetation in the bottom of the canyon, grading of the landfill area, and installation of the drainage and water management facilities. Bulldozers would be the primary type of equipment required to complete the majority of these operations. Although most of the equipment needed is probably already at the Corinda Los Trancos landfill, some additional equipment may be required.

The only receptor near the landfill operation is the Gossett residence in Apanolio Canyon. Construction operations would be audible from the residence, however, the distance (approx. 1,500 feet) and shielding effect of trees and topography near the residence would probably reduce the noise levels at the residence to levels currently created by the landfill operation in Corinda Los Trancos Canyon.

Operation of transfer and collection trucks along the access road to the landfill would be similar to the levels which currently exist. These levels, measured to be between 38 and 45 dBA at the nearest residence, would be intermittent in nature and would be within the noise level standards for unincorporated areas of the County (Thomas Reid Associates, 1986). This standard, established by the San Mateo County Noise Ordinance, forbids the creation of any noise which exceeds a level of 60 dBA as measured at a single family dwelling from any source which generates noise for 5 to 15 cumulative minutes in an hour.

b. Apanolio Canyon - 850-foot

The noise generated from traffic and landfill operation under this alternative would be the same as those under the 1,200-foot Apanolio Canyon alternative. The life-span of the reduced project is approximately 25 years, which would result in earlier closure of the landfill relative to the 1,200-foot alternative. At the time of closure, traffic to the facility would cease, and noise impacts to the Highway 92 corridor resulting from landfill traffic would no longer occur. Noise impacts along Highway 92 and in the landfill area would be the same as for the *proposed 1,200-foot* alternative during the operational life of the landfill.

c. Corinda Los Trancos Canyon - Forefill

This alternative, while in operation would have noise impacts similar to the Apanolio Canyon 1,200-foot alternative. However, since the life-span of this alternative is estimated to be 16 years, the noise impacts along Highway 92 and in the landfill area would be for a shorter period of time.

d. Nuff Canyon

Landfill noise sources would be of the same nature and extent as those identified in the Apanolio Canyon 1,200-foot alternative. However, the impacts of these noise sources would occur in Nuff Canyon rather than in the Apanolio Canyon/Corinda los Trancos Canyon area. Noise from equipment used in landfill operation would be confined to the northern portion of Nuff Canyon and would not impact any sensitive receptors. The only noise impact from this alternative would be an increase in the noise levels at the intersection of the quarry access road and Highway 92. This area is currently impacted by noise generated by turning quarry trucks. Additional landfill traffic would increase the number of truck turns at the intersection, increasing the number of noise exposures to receptors along this area of Highway 92. Noise generated at the Corinda Los Trancos Canyon access road intersection would be displaced to the quarry access road.

e. No Action

Under the No Action Alternative, Ox Mountain Sanitary Landfill truck traffic noise along Highway 92 would not occur after the closure of the existing landfill operation. After closure of the existing facility, the landfill activities would be diverted to another location either within San Mateo County or along major transportation haul routes to an out-of-county location.

f. Mitigation Measures

No mitigation measures are suggested at this time.

5.7 Public Health and Safety

a. Apanolio Canyon - 1,200-foot

Landfill Gases

Methane from decomposition of refuse at the project could pose a potential for fire or explosion. The proposed project would accept approximately 673,000 tons of waste per year. At this rate, the site would exceed 1 million tons of waste in place during the second year of operation. BAAQMD regulations would therefore require the installation of a methane collection system. This would reduce the risk of fire or explosion and reduce hydrocarbon emissions.

Dust Generation

Generation of fugitive dust from the project could pose a potential health hazard to landfill employees and the public. Impacts and mitigation measures associated with dust generation are addressed under Air Quality, Section 5.5.

Vectors

Destruction of natural habitat in Apanolio Canyon and development of a waste disposal site could increase vector populations in areas adjacent to the project creating a potential nuisance or health hazard. If the surrounding areas are not capable of handling the increased population, local residences could notice increases in rodent populations. However, due to the remote nature of the surrounding areas, this is not likely to be a significant problem.

Fires

A fire at the proposed landfill could have a severe impact on the surrounding areas. There has not been a major fire in the Pilarcitos Creek watershed since 1929 (Thomas Reid Associates, and Fehr & Peers Associates, 1986) and therefore, the fuel load in this area is very high. The San Francisco Fish and Game Refuge adjacent to Apanolio Canyon is considered a Hazardous Fire Area by the California Department of Forestry (CDF) due to its high fuel load and inaccessibility. A major fire in the upper portion of the Pilarcitos watershed could have a severe impact on this watershed and the San Francisco Water District Watershed. Siltation and erosion problems could result from the destruction of the vegetative cover (Thomas Reid Associates, 1984).

The worst fire conditions in the area generally occur from mid-September through October. At these times, temperature inversions can occur, causing a reversal of summertime wind patterns resulting in down canyon winds in the morning and up canyon winds in the evening (Thomas Reid Associates, 1984).

Approximately seven days a year, from August through October, CDF declares Red Flag conditions indicating highest fire danger. Under these conditions, the City of Half Moon Bay could potentially be threatened by fire moving toward the west as winds blow from the east or northeast and fuel moisture is low (Thomas Reid Associates, 1984).

There have been no major fires at the Corinda Los Trancos Canyon landfill; however, accidental fires could occur. The threat to off-site areas from a landfill fire would be small. The nature of the landfill

operation, relatively large area of barren soil, and the presence of heavy equipment (e.g., bulldozers) on site would reduce the potential for a fire to spread from the landfill onto surrounding wildlands. If a fire at the proposed landfill were allowed to spread beyond the project site, severe damage to surrounding areas could result. Use of controlled burns, outlined in the project mitigation plan for biology (5.3f), would reduce fuel buildup in the surrounding natural canyon areas.

Domestic Water Supply

Failure of the leachate collection and removal system and landfill liner could allow infiltration of contaminants into the ground-water system and could impact well or surface waters downgradient of the facility. If infiltration occurred, the contingency plan for protection of water resources would be triggered. Correction of water quality degradation could be difficult. Water contamination could continue well beyond the life of the landfill, as long as leachate was allowed to migrate from the landfill. Water quality impacts and mitigation measures are discussed further under Hydrology and Water Quality, Section 5.2.

Truck Traffic

Truck traffic associated with the project could increase the potential for traffic accidents on Highway 92. Traffic delays caused by large transfer trucks could result in attempts by operators of other vehicles to pass these trucks under unsafe conditions, thereby creating a potential for traffic accidents and associated injuries. An additional concern is the risk of fire within the transfer trucks from burning refuse which could

cause hazardous driving conditions or explosion of diesel fuel (Thomas Reid Associates, 1984).

The California Department of Forestry and Half Moon Bay Fire Prevention District have responsibility to respond to medical emergencies within the project and surrounding areas. Response time for emergency equipment may increase due to slow traffic on Highway 92 caused in part by landfill truck traffic (Thomas Reid Associates, 1984).

Site Security

If security measures currently employed at the Corinda Los Trancos Canyon landfill continue to be maintained for the proposed project at Apanolio, little impact to public safety is expected.

Employee Safety

Landfill personnel are potentially subject to risks of injury or other health hazards from operation of heavy equipment, contact with refuse, fire, and fugitive dust generated from landfill operations.

b. Apanolio Canyon - 850-foot

Landfill Gases

This alternative would result in little change in the potential impacts from landfill gases. Although this alternative would have a smaller capacity than if the canyon were filled to 1,200 feet, the amount of refuse accepted on a daily basis would remain unchanged and the methane recovery system would be required during the second year of operation. The final volume of fill would be less and, therefore, the total amount of methane generated over the life of the landfill would be less.

Dust Generation

The amount of refuse accepted on a daily basis at the site would remain unchanged under this alternative. The level of activity at the site would be the same and therefore, dust generation would be the same as for the 1,200-foot alternative.

Vectors

Potential impact from vectors would change little under this alternative. The same amount of refuse would be accepted on a daily basis, but because of the shorter life-span of this alternative, the impact would be for a fewer number of years.

Fires

A slight decrease in fire potential could occur under this alternative. The landfill would ultimately cover a smaller area and would not extend as far up the canyon as the 1,200-foot alternative. This, combined with a shorter life-span, may result in somewhat less potential for a fire to spread in or beyond Apanolio Canyon. However, the difference in fire potential between this alternative and the 1,200-foot alternative is probably insignificant.

Domestic Water Supply

Potential impact on water quality may be slightly less under this alternative. During the later stages of development of the 1,200-foot alternative, placing a competent liner on the upper reaches of Apanolio Canyon would increase the potential for failure of the liner. This alternative would avoid landfill liner construction on the upper canyon slopes.

Truck Traffic

The potential for traffic accidents and delays in response time for emergency equipment would be the same for this alternative as for the 1,200-foot alternative. Under this alternative the landfill would have a smaller ultimate capacity and, therefore, the potential for accepting refuse from other areas and the associated increase in potential for traffic accidents would be reduced.

Site Security

Potential impacts associated with site security would remain unchanged under this alternative.

Employee Safety

Potential impacts associated with employee safety would remain unchanged under this alternative.

c. Corinda Los Trancos Canyon - Forefill

Landfill Gases

This alternative would result in little change in the impacts from landfill gases. The site would have a smaller capacity than the *proposed Apanollo Canyon* alternative; however, the amount of refuse accepted on a daily basis would remain unchanged and a methane recovery system would still be required during the second year of operation. The final volume of fill would be less under this alternative and, therefore, the total amount of methane produced over the life of the project would be reduced.

Dust Generation

The amount of refuse accepted at the site on a daily basis would remain unchanged under this alternative, and the level of activity at the site would be the same; therefore, dust generation would not change.

Vectors

Potential impact from vectors under this alternative would be similar to the *the proposed Apanolio Canyon* alternative. The total amount of refuse accepted on a daily basis would be the same, but the impact would be for a fewer number of years.

Fires

The potential for a wildland fire may be reduced under this alternative. The area is less wooded than Apanolio Canyon which would reduce the amount of fuel available in the event of fire spreading from the landfill site. The area is also more accessible to fire fighting equipment than Apanolio Canyon.

Domestic Water Supply

The potential for impact on water quality may be slightly less under this alternative. The area has much more gentle relief which reduces the risk of liner failure on steep slopes. However, the proposed landfill design for this alternative would require some of the water collected by the underdrain system to be pumped from the base of the landfill. A major failure in the pumping system could cause a buildup of water beneath the landfill and potentially result in failure of the liner or leachate containment system.

Truck Traffic

The potential for traffic accidents and delays in response time for emergency equipment would be similar for this alternative as for the *proposed Apanolio Canyon* alternative. The smaller landfill capacity would reduce the potential for accepting refuse from other areas. Thus, the associated increase in potential for traffic accidents would be reduced.

Site Security

Potential impacts associated with site security would remain unchanged under this alternative.

Employee Safety

Potential impacts associated with employee safety would remain unchanged under this alternative.

d. Nuff Canyon

Landfill Gases

This alternative would result in little change in the potential impacts from landfill gases. Although this alternative would have a smaller capacity than the 1,200-foot Apanolio Canyon alternative, the amount of refuse accepted on a daily basis would remain unchanged and a methane recovery system would be required during the second year of operation. The final volume of fill would be less and, therefore, the total amount of methane generated over the life of the landfill would be less.

Dust Generation

Dust generation would remain essentially unchanged under this alternative. However, the life-span of this alternative would be shorter, reducing the duration of fugitive dust emissions.

Vectors

Impacts associated with vectors would remain essentially the same under this alternative, but the duration of the impact would be less due to the shorter life-span of the landfill.

Fires

Because the terrain in Nuff Canyon is less severe than Apanolio Canyon, fire danger may be slightly less. The rim of Nuff Canyon cannot be easily accessed by fire fighting equipment, which may decrease the effectiveness of ground-based fire fighting equipment.

Domestic Water Supply

Because the bedrock geology of Nuff Canyon is similar to that of Apanolio Canyon, the potential for contaminants reaching the ground water would be similar to the *Apanolio Canyon alternatives*. The proposed landfill design for this alternative would require pumping of some water from the underdrain system. If a major failure in the pumping system occurred, water could build up beneath the landfill and a liner failure could potentially result. However, there are fewer ground-water users immediately down gradient of Nuff Canyon that could be affected by ground-water contaminants than there are in Apanolio Canyon.

Truck Traffic

Potential impacts from the volume of truck traffic would be similar under this alternative. Access to the landfill would be from a different road than with the *other landfill alternatives*. If the quarry continued to operate during operation of the landfill in Nuff Canyon, the truck

traffic from the two operations would use the same access to Highway 92. Combined operation could cause additional traffic congestion at the intersection of Highway 92 and potentially increase the traffic accidents. Additionally, truck traffic in the vicinity of the quarry operations may present additional hazards to vehicles accessing the landfill.

Site Security

Potential impacts associated with site security would be expected to remain unchanged under this alternative.

Employee Safety

Employee safety may require additional precautions under this alternative. Additional truck traffic associated with the quarry may increase the potential for traffic hazards in the area of the quarry operations.

e. No Action

The No Action Alternative would eliminate the potential public health and safety impacts associated with the project once the Corinda Los Trancos landfill has reached its capacity. It would then be necessary to locate another landfill site to dispose of refuse from San Mateo County where similar impacts to public health and safety could occur.

If an alternative landfill site could not be identified and permitted prior to closure of the Corinda Los Trancos Canyon Landfill, and an out-of-county disposal site could not be negotiated, San Mateo County would be faced with a solid waste disposal crisis. Lack of adequate disposal capacity would result in buildup of solid waste at their respective sources

(e.g., private residences, commercial areas). This would create significant public health impacts and could also increase indiscriminant dumping of solid waste along roadsides and secluded areas within and near San Mateo County.

f. Mitigation Measures

- The applicant shall comply with State Air Resources Board requirements for installation of a methane recovery system.
- Refuse shall be compacted daily to control vectors and if necessary (as determined by the San Mateo County Office of Environmental Health), the refuse shall be covered daily with soil.
- Refuse handling equipment should be inspected frequently to minimize the risk of refuse fire caused by electrical shorts and hydraulic or fuel leaks.
- Smoldering or burning refuse loads shall be extinguished with soil or water before being incorporated into the fill.
- Adequate fire breaks (as determined by CDF) shall be provided around the operating perimeter, around all structures, and along the boundary between Apanolio Canyon and the San Francisco Water Districts watershed.
- The project site should be fenced to reasonably prevent access. Gates should remain locked during non-operating hours.
- Adequate lighting should be provided at the main access gate and around structures and facilities.
- Proper drainage should be maintained at the site to avoid ponding, thus reducing potential mosquito habitat.
- Controlled burns should be conducted on the upper slopes of the site area to reduce the quantity of fuels available in the event a wildland fire occurred.
- Landfill employees shall be trained in safe handling of solid waste and identification of hazardous substances. Refresher courses shall be periodically required. Courses shall include accident prevention, safety, first aid, and instruction in safe equipment operation.

- Employees shall be required to use safety equipment as necessary such as hard hats, goggles, dust masks, coveralls, and gloves.
- First aid supplies shall be available at all times on site.

(Traffic mitigation measures are addressed under Transportation, Section 5.4)

5.8 Public Facilities and Services

a. Apanolio Canyon - 1,200-foot

The *proposed* project most likely would not increase the demand for police protection services.

Project operation could increase the potential for fires in the area. Factors that could increase the risk of fire include disposal of illegal volatile substances, ignition of smoldering materials, spontaneous combustion of refuse, and ignition of refuse from normal landfill equipment operations (Thomas Reid Associates, 1984).

A fire at the landfill site could be spread to surrounding chaparral and woodland areas. During late summer and early fall, fuel moisture is low and winds sometimes blow from the east. Under these conditions, a fire at the landfill could be driven to the west by these winds and potentially threaten the City of Half Moon Bay.

An increased possibility of wildland fires in its jurisdiction could impose an additional burden on the CDFFP.

b. Apanolio Canyon - 850-foot

Impacts to public facilities and services under this alternative would be similar to the Apanolio Canyon 1,200-foot project during landfill

operation. However, since the estimated life-span of this alternative is 25 years, these potential impacts would occur for a shorter period of time.

c. Corinda Los Trancos Canyon - Forefill

Potential impacts to public facilities and services from a forefill project would be similar to the Apanolio Canyon 1,200-foot alternative. The projected life-span of this alternative is 16 years and thus potential impact to public services would occur for a shorter period of time.

d. Nuff Canyon

Public facility and service impacts from a Nuff Canyon project would be similar to those identified for the 1,200-foot Apanolio Canyon alternative. However, since the estimated life-span of this alternative is 27 years, potential impacts would occur for a shorter period of time.

e. No Action

Whether an existing out-of-county landfill or another in-county site is selected to accept San Mateo County's solid waste, impacts of the project on both police and fire protection cannot be fully evaluated until a specific site is designated.

The potential for fire within the landfill resulting from landfill operations and the presence of refuse would be similar to that addressed for the previous alternatives. The extent of fire damage to surrounding areas would depend upon the land uses and vegetation in the vicinity of the solid waste site.

f. Mitigation Measures

- BFI should investigate the possibility of annexation into the Half Moon Bay FPD if either the Nuff or Apanolio Canyon alternatives is designated for landfill expansion.

Additional fire mitigation measures are addressed under Section 5.7, Public Health and Safety.

5.9 Cultural Resources

a. Apanolio Canyon - 1,200-foot

Since no archaeological artifacts were discovered in the Apanolio Canyon area during the investigation, the landfill expansion project could have no effect on cultural resources.

b. Apanolio Canyon - 850-foot

No impacts on cultural resources are anticipated.

c. Corinda Los Trancos Landfill - Forefill

No cultural resources were identified in the project area; therefore, no impacts are anticipated.

d. Nuff Canyon

No field investigation was conducted in Nuff Canyon and, therefore, potential impacts to cultural resources cannot be estimated. However, due to the lack of surface remains in Apanolio and Corinda Los Trancos Canyons, and the close proximity of Nuff Canyon to these sites, it is unlikely that impact to cultural resources would occur.

e. No Action

Under the No Action Alternative, the cultural resources of the selected site would have to be assessed by both a literature search and a field investigation. Any impacts to potential cultural resources associated with landfill development in Apanolio Canyon would not occur.

f. Mitigation Measures

Although the presence of cultural resources has not been established in any of the previously assessed canyon sites, the following mitigations are proposed should any archaeological artifacts be revealed during project construction.

- If any buried archaeological deposits are discovered, a qualified archaeologist should be contacted to evaluate the find and recommend appropriate actions. Subsequently, the following monitoring procedures should be utilized when further removing any native soils.
- A Native American Advisor should be identified prior to any major excavations. If prehistoric deposits are identified in the project area, appropriate access should be arranged for reburial of any prehistoric human remains.
- Close monitoring should occur during excavation.
- If either isolated human bone or prehistoric human burials are encountered, the material should be removed and retained by the archaeologist. Work should immediately cease in the vicinity of the find, and the County Coroner, archaeologist, owner, and Native American Advisor should be contacted.
- Upon identification of significant cultural resources other than human burials, the above procedures should be followed.

5.10 Aesthetics

a. Apanolio Canyon - 1,200-foot

The proposed landfill expansion would affect the viewshed primarily by disturbing the natural landforms within upper Apanolio Canyon. Other visual impacts associated with the project would include the construction of the access road, grading of the borrow site between Corinda Los Trancos and Apanolio Canyon, and nuisance aspects.

The mass of fill would considerably diminish the long-term aesthetic values within the canyon, and would be visible to observers on surrounding privately owned ridges (primarily BFI property). Engineered slopes averaging 15 to 20 percent would be terraced from the toe of the landfill toward the rear of the canyon. The higher elevations of the landfill (to 1,200 feet) would be screened from motorists on State Highway 92 by intervening ridges (Thomas Reid Associates, 1984).

The new haul road would extend from the existing Corinda Los Trancos Canyon landfill access road over the ridge into Apanolio Canyon. As it crosses the intervening ridge, this road would be noticeable from portions of private property owned by Gilbert Gossett, located in Apanolio Canyon below the expansion site. The road would also be visible from BFI property along private Frenchman's Creek Road; however, no residences are located along the affected portion of this road (Thomas Reid Associates, 1984).

Nuisance elements such as blowing waste and paper would most likely remain in the immediate project area and are not anticipated to cause visual impacts beyond this location. Transport vehicles en route to the landfill

site would be expected to sufficiently contain the disposal materials, thus minimizing litter along roadways (Thomas Reid Associates, 1984).

b. Apanolio Canyon - 850-foot

Aesthetic impacts resulting from filling Apanolio Canyon to an elevation of 850 feet would be essentially the same as those for the 1,200-foot alternative. While the natural character within the canyon would be dramatically altered below 850 feet, the upper elevations would remain virtually untouched. Although the fill would be noticeable from the higher elevations within the canyon, no off-site visual effects are anticipated.

Alignment of the haul road has not been designed for this alternative; however, any potential aesthetic impact to observers on Frenchman's Creek Road and on the Gossett property would be considered minimal.

Blowing materials should remain inside the canyon walls, concentrating primarily around the fill area.

c. Corinda Los Trancos Canyon - Forefill

The forefill project would cause on-site aesthetic impacts related to the alteration of natural landforms within the canyon south of the existing landfill. However, since the terrain has already been modified by landfill operations, additional activity would not substantially detract from the canyon's long-term visual character except from vantage points within the canyon itself.

The existing haul road would be used for solid waste transport to the fill site, resulting in no further aesthetic disturbance.

Because of the orientation of the canyon walls with respect to State Highway 92, the forefill area would be screened from motorists and other observers on this road. Although noticeable from Half Moon Bay, the site would probably not be distinguished as a landfill from this distance (Thomas Reid Associates, 1984).

d. Nuff Canyon

Expansion of the Ox Mountain Sanitary Landfill into Nuff Canyon would cause aesthetic impacts both by modifying undisturbed terrain in the upper canyon elevations, and by eliminating approximately 117 acres of natural vegetation. Landfill operations and permanent fill would alter the viewshed particularly from within and along the canyon rim. The facility potentially could be visible from higher elevations east of the canyon. However, the project could not be observed from any residences along State Highway 92.

Although a detailed engineering layout has not been completed for a project in Nuff Canyon, it is expected that the existing quarry road could be utilized for solid waste transport to the landfill. This would minimize on-site visual disturbance.

e. No Action

Under the No Action Alternative, landfill expansion would not take place in Apanolio Canyon. The terrain and landscape character of this canyon would remain in a natural state.

However, this option requires an alternate in-county site or out-of-county landfill to be designated for San Mateo County's waste disposal. Because no sites have been proposed outside the area, it is not

possible to assess potential aesthetic effects from this alternative.

Visual consequences from the landfill proposal would largely depend on the capacity of the facility, vegetation removal, and landform modifications.

The effectiveness of resource recovery programs would be instrumental in determining the life-span of the future site.

f. Mitigation Measures

- Revegetation of the face of each fill layer (lift) site should occur after each lift has been completed.
- Selected species for revegetation should be compatible with the surrounding native vegetation.
- Final contouring of the fill layers should appear as gradual as possible to blend with the natural undisturbed terrain.
- Cleanup crews should continue to patrol landfill and surrounding areas for windblown material.

5.11 Land Use Plans and Policies

a. Apanolio Canyon - 1,200-foot

Expansion of the Ox Mountain Landfill at Apanolio Canyon would affect a substantial portion of upper Apanolio Canyon. This expansion would not only convert existing open space to a more intensive use, but would disturb the natural environment of the canyon by removing established vegetation and by substantially altering the existing terrain. Development of the canyon for a solid waste facility would further result in a loss of an estimated 3.43 acres of wetlands. These effects are discussed in Section 5.3a.

The proposed landfill project would be consistent with the land use plans and policies that influence future activity of the canyon property. A

solid waste disposal site in Apanolio Canyon would be compatible with the surrounding agricultural and open space lands, provided an adequate buffer zone were incorporated.

b. Apanolio Canyon - 850-foot

Filling Apanolio Canyon to an elevation of 850 feet would have essentially the same land use impacts as those of the previous alternative, although to a lesser degree. Existing vegetation between 850 feet and 1200 feet would be preserved and landform modifications would be less severe.

The land use plans and policies that would apply to the 1,200-foot alternative also pertain to this 850-foot proposal for expansion into the canyon site. While this alternative would also be consistent with land use plans for the canyon, it would not meet the County's objective of designating a long-term landfill.

c. Corinda Los Trancos Canyon - Forefill

While development of Apanolio Canyon as a solid waste facility would not affect current land uses, the forefill alternative would displace the caretaker's residence and portions of the operating tree farm.

This alternative would modify the existing landforms and eliminate natural vegetative cover, particularly on the side slopes.

Extension of the operating solid waste site into the forefill area would be consistent with land use plans and policies outlined in the General Plan. Although the SWMP specifically addresses Apanolio Canyon as a future disposal site, Ox Mountain Landfill is further designated as the long-term

solid waste facility. Therefore, it is assumed that the forefill alternative would be in compliance with the objectives stated in this plan.

For a landfill expansion to occur in Corinda Los Trancos Canyon, a Supplemental Environmental Impact Report (SEIR) to the approved Ox Mountain Sanitary Landfill, Apanolio Canyon Expansion (Thomas Reid Associates, 1984) would likely be required pursuant to CEQA. This alternative would further necessitate an amendment to the existing use permit issued for current solid waste disposal activities in the canyon. A Corps EIS may also be required since this alternative would potentially fill wetland areas.

d. Nuff Canyon

Expansion of the Ox Mountain Sanitary Landfill into Nuff Canyon would conflict with mining operations conducted at Pilarcitos Quarry. Use of overburden in the canyon for landfill cover would reduce the quantity available to quarry operators. Currently this excavated material is transported off site for general fill uses (Martin Carpenter Associates, 1985).

Incorporating a disposal facility in Nuff Canyon would further preclude the site's use for future valuable mineral resource extraction which is projected to continue into the northern portion of the canyon up to the 1,000-foot elevation. Development of a landfill would fill the northern portion of the canyon (from Elevation 500 feet to 1,100 feet), thus preventing access to the mineral resource in this area.

The County SWMP does not specifically address Nuff Canyon as a solid waste disposal site, thus an amendment to this plan would be required. The

Mineral Resources Chapter of the General Plan, Policy 3.4 calls for the "rehabilitation and reuse of mineral extraction areas." The current surface mining permit for Pilarcitos Quarry lists a landfill as the site's end use. (Rozar, pers. com., October 16, 1987). However, future mineral extraction is predicted to continue beyond the year 2050 (Martin Carpenter Associates, 1985).

A solid waste facility in Nuff Canyon would not be consistent with the General Plan unless protection of the mineral resource could be achieved. Policies 3.2 and 3.8 express that significant mineral resource areas will be "protected from encroachment by incompatible land uses" to "insure that mineral resources continue to be available as needed" (San Mateo County, 1985b).

If Nuff Canyon were utilized as a landfill, identification of an alternate mineral resource area of equal significance to Pilarcitos Quarry would be required. Additionally, use permits for expansion of the quarry into upper Nuff Canyon would be denied in favor of a solid waste facility.

This alternative also would require removal of the cabin in the northern portion of the canyon which has not been in use for a number of years. The project would also eliminate several acres of open grazing lands within the canyon, but would not adversely affect agricultural utilization of the area.

A certified Environmental Impact Report (EIR) would be required for expansion into Nuff Canyon prior to approval of the use permit. A Corps EIS may also be required for a project in Nuff Canyon. Since the canyon is within the Local Coastal Zone, a Coastal Development Permit must also be

obtained for the project. Securing the necessary permits could happen concurrently with the environmental review but this process may delay the project nine months or more.

e. No Action

The No Action Alternative stipulates that an alternate in-county site or out-of-county landfill would be designated for disposal of San Mateo County's solid waste.

Since the northern portion of Apanolio Canyon would not be used as a landfill, existing land uses would remain in place.

Placement of solid waste at an alternate site would require specific permits and compliance with applicable land use plans and policies set forth for that project area. These impacts cannot be assessed until a site is identified.

f. Mitigation Measures

Apanolio Canyon - 1,200-foot

- No additional mitigations are required.

Apanolio Canyon - 850-foot

- No additional mitigations are required.

Corinda Los Trancos Canyon - Forefill

- The existing use permit must be amended through the County.
- A grading permit and Coastal Development Permit must be obtained from the County.
- A SEIR must be prepared in accordance with CEQA requirements and ultimately certified.
- A Corps EIS may be required for evaluation of impacts to wetlands potentially occurring along Corinda Los Trancos Creek.

Nuff Canyon

- An EIR must be prepared in accordance with CEQA requirements and ultimately certified.
- A use permit, a Coastal Development Permit, and a grading permit must be obtained from the County.
- The SWMP must be amended to allow a solid waste facility in Nuff Canyon.
- A new quarry site should be identified to compensate loss of resource availability in northern Nuff Canyon.
- A Corps EIS may be required for evaluation of impacts to wetlands potentially occurring along Nuff Creek.

5.12 Economics

a. Apanolio Canyon - 1,200-foot

Project Costs

Costs for construction of the proposed project would total approximately \$129.4 million, of which \$120.2 million would be for actual construction and \$9.2 million would be for design, permitting, and related construction services. Project costs are further itemized in Table 5.12-1 and initial construction costs are presented in Table 5.12-2. These landfill costs were estimated using a quantity, or unit (e.g., cubic yard), and a representative unit cost (e.g., dollars per cubic yard).

Based on an estimated life-span of 93 years for the facility, the average annual cost (excluding contingency plan costs) would be about \$1.4 million or \$1.05 per cubic yard of in-place compacted refuse.

The above costs incorporate anticipated wages for construction; however, an accurate number of employees required for project construction cannot be determined at this time.

Table 5.12-1. Construction Costs for Proposed Apanollo Canyon Project and Alternatives
(millions of dollars)

	Alternative			
	Apanollo Canyon 1,200-foot	Apanollo Canyon 850-foot	Corinda Los Trancos Canyon Forefill	Nuff Canyon
Design and Permitting Services	\$ 5.0	\$ 5.0	\$ 4.0	\$ 4.5
Construction Services	4.3	2.1	3.6	4.5
Access Road Improvements	2.6	2.6	0.9	2.0
Initial Construction/Site Preparation, Siltation Basin, Toe Berm, Dam, Maintenance Road	3.1	3.1	32.9	32.9
Phase I of Underdrain, Leachate Collection and Removal System, Liner, Diverting Channels, Upstream Ponds	15.0	8.0	7.0	12.0
Infrastructure Facilities Required beyond Initial Construction	22.5	5.8	5.1	8.0
Cover Material Excavation/Final Cover	61.6	48.5	14.9	24.1
Construction Contingency	<u>15.3</u>	<u>10.1</u>	<u>9.2</u>	<u>11.8</u>
Total	\$129.4	\$85.2	\$77.6	\$99.8
Landfill Life-span	93 years	25 years	16 years	27 years
Annual Cost	\$1.4	\$3.4	\$4.9	\$3.7

Source: Purcell, Rhoades & Associates and Brian Kangas Foulk, 1987.

Table 5.12-2. Initial Construction Costs for Proposed Apanollo Canyon Project
and Alternatives (millions of dollars)

<u>Construction Component</u>	<u>Apanollo Canyon (1,200')</u>	<u>Apanollo Canyon (850')</u>	<u>Corinda Los Trancos Canyon Forefill</u>	<u>Nuff Canyon</u>
Initial Excavation	0.53	0.53	10.80	14.3
Engineered Fill	0.12	0.12	5.60	5.60
Cutoff Grout Curtain	0.41	0.41	0.53	0.24
Impermeable Core	0.21	0.21	9.60	8.40
Pump Station	0	0	1.78	1.78
Siltation Basin	0.46	0.46	1.10	1.10
Siltation Basin Dam	1.10	1.10	3.00	1.50
Maintenance Road	0.24	0.24	0.02	0.04
Treatment Pond Relocation	0	0	0.50	0
Total	3.07	3.07	32.93	32.96

Source: Brian Kangas Foulk & Associates, 1988.

Although not a part of the landfill construction cost, additional costs would be associated with contingency plan implementation. Contingency implementation costs for Apanolio Canyon would depend on the nature of the corrective action required. Estimated costs associated with several actions are: \$1.8 million for construction of perimeter drains; \$330,000 for construction of a grout curtain cutoff wall and leachate plume removal; and \$1.14 million for replacement of downstream water supplies via a pipeline from the Half Moon Bay Water District. Post-closure maintenance costs are estimated to be \$570,000 per year, totalling \$17.1 million for the 30-year post-closure maintenance period.

b. Apanolio Canyon - 850-foot

Project Costs

Costs for construction of the reduced project in Apanolio Canyon would total approximately \$85.2 million, of which \$78.1 million would be for actual construction and \$7.1 million would be for design, permitting, and related construction services. Project costs are further itemized in Table 5.12-1 and Table 5.12-2.

Construction costs for this alternative are lower than the Apanolio Canyon 1,200-foot alternative primarily because of the reduced magnitude of the infrastructure facilities, the underdrain, leachate and ground-water management systems, and cover material required by this reduced alternative. Other cost factors, for example, access road improvements and initial construction, are relatively similar to the *proposed 1,200-foot* alternative. Facilities and structures common to both the reduced and *proposed* Apanolio Canyon alternatives would have similar costs. However,

when cost vs. capacity is considered, this alternative is more costly per cubic yard of refuse disposed. Based on an estimated life-span of 25 years for the facility, the average annual costs (excluding contingency plan costs) would be about \$3.4 million, or \$3.09 per cubic yard of compacted refuse.

The above costs incorporate anticipated wages for construction; however, an accurate number of employees required for project construction cannot be determined at this time.

Although not a part of the landfill construction cost, additional costs would be associated with contingency plan implementation.

Contingency implementation costs for this alternative would be the same as for the Apanolio Canyon 1,200-foot alternative. Estimated costs associated with several actions are: \$1.8 million for construction perimeter drains, \$330,000 for construction of a grout curtain cutoff wall and leachate plume removal; and \$1.14 million for replacement of downstream water supplies via a pipeline from the Half Moon Bay Water District.

Post-closure maintenance costs for the reduced project in Apanolio Canyon are estimated to be \$256,000. Total post-closure costs (30-year period) would be \$7.7 million.

c. Corinda Los Trancos Canyon

Project Costs

Costs for construction of a landfill in the forefill area of Corinda Los Trancos Canyon would total approximately \$77.6 million, of which \$70.0 million would be for actual construction and \$7.6 million would be for design, permitting, and related construction services.

As described in Section 3.5c., Proposed Action and Alternatives, Corinda Los Trancos Canyon, the design of the disposal site in Corinda Los Trancos Canyon would be similar in concept to that for the Apanolio Canyon alternatives. The costs presented in Table 5.12-1 indicate that the Forefill Alternative is less costly for all components with the exception of initial construction. Initial construction costs are presented in greater detail in Table 5.12-2. The volume of sedimentary material requiring removal at the site, combined with the construction of the toe berm and associated structures is estimated to be over 10 times as costly than comparable components in Apanolio Canyon. Excavations in Corinda Los Trancos Canyon would extend to a much greater depth and would be much wider than required in Apanolio Canyon. For example, initial excavation in Apanolio Canyon would remove an estimated 266,400 cubic yards of overburden materials compared to 3.6 million cubic yards requiring removal in Corinda Los Trancos Canyon. Similarly, placement of the engineered fill and impermeable core in construction of the toe berm in Apanolio Canyon would require 48,600 and 21,00 cubic yards, respectively. The comparable volumes required in Corinda Los Trancos Canyon would be 2 million and 800,000 cubic yards respectively. These are typical examples of the increased complexity in engineering and construction activity required in Corinda Los Trancos Canyon compared to the Apanolio Canyon site. In addition, approximately \$1.8 million would be required for construction of an underground leachate/ground-water pumping station, a facility that would not be required in Apanolio Canyon. These increased construction costs are a direct result

of the differing geologic and hydrologic conditions between the northern portion of Apanolio Canyon and the mid portion of Corinda Los Trancos Canyon.

Based on an estimated life-span of 16 years for the facility, the average annual cost (excluding contingency plan costs) would be about \$4.9 million, or \$4.49 per cubic yard of compacted refuse, a higher per cubic yard disposal cost than the Apanolio Canyon alternatives.

The above costs incorporate anticipated wages for construction; however, an accurate number of employees required for project construction cannot be determined at this time.

Contingency implementation costs for the Corinda Los Trancos Canyon alternative would, as with Apanolio Canyon alternatives, depend on the nature of the corrective action required. Estimated costs associated with several actions are: \$1.01 million for construction of perimeter drains; \$630,000 for construction of a grout curtain cutoff wall and leachate plume removal; and \$740,000 for replacement of downstream water supplies via a pipeline from the Half Moon Bay Water District.

Estimated post-closure maintenance cost for the 30-year maintenance period is \$5.1 million, or \$172,000 annually.

d. Nuff Canyon

Project Costs

Costs for construction of a landfill in Nuff Canyon would total approximately \$99.8 million, of which \$90.8 million would be for actual construction and \$9.0 million would be for design, permitting and related

construction services. As described in Section 3.5d., Proposed Action and Alternatives, Nuff Canyon, the design of the disposal site in Nuff Canyon would be similar in concept to that for the Apanolio Canyon alternatives. The costs presented in Table 5.12-1 indicate that the this alternative is less costly for all components with the exception of initial construction and slightly higher construction services. Initial construction costs are presented in greater detail in Table 5.12-2. The Nuff Canyon site is similar to the Corinda Los Trancos Canyon site with regard to geology. As with the Forefill Alternative, a Nuff Canyon project would require massive removal of sedimentary materials from the canyon bottom. The costs associated with this action and the construction of landfill toe structures are far greater than for the Apanolio Canyon alternatives. As with Corinda Los Trancos Canyon, initial construction is estimated to be over 10 times as costly than comparable components in Apanolio Canyon. Excavations in Nuff Canyon would extend to a much greater depth and would be much wider than required in Apanolio Canyon. For example, initial excavation in Apanolio Canyon would remove an estimated 266,400 cubic yards of overburden materials compared to 4.8 million cubic yards requiring removal in Nuff Canyon. Similarly, placement of the engineered fill and impermeable core in construction of the toe berm in Apanolio Canyon would require 48,600 and 21,000 cubic yards, respectively. The comparable volumes required in Nuff Canyon would be 2 million and 700,000 cubic yards, respectively. In addition, approximately \$1.8 million would be required for construction of an underground leachate/ground-water pumping station, a facility that would

not be required in Apanolio Canyon. These are typical examples of the increased complexity in engineering and construction activity required in Nuff Canyon compared to the Apanolio Canyon site. These increased construction costs are a direct result of the differing geologic and hydrologic conditions between the canyon sites.

Based on an estimated life-span of 27 years for the facility, the average annual cost (excluding contingency plan costs) would be about \$3.7 million, or \$3.30 per cubic yard of compacted refuse.

The above costs incorporate anticipated wages for construction; however, an accurate number of employees required for project construction cannot be determined at this time.

Contingency implementation costs for this alternative would, as with Apanolio Canyon alternatives, depend on the nature of the corrective action required. Estimated costs associated with several actions are: \$1.21 million for construction of perimeter drains; \$330,000 for construction of a grout curtain cutoff wall and leachate plume removal; and \$1.17 million for replacement of downstream water supplies via a pipeline from the Half Moon Bay Water District.

Annual cost for post-closure maintenance in Nuff Canyon is estimated to be \$246,000, totalling \$7.4 million for the 30-year post-closure period.

Quarry Resource Value

Using available information from the Pilarcitos Quarry Reclamation Plan (Martin Carpenter Associates, 1985) and information provided by quarry planners, an estimate of the value of the mineral resources remaining in Nuff Canyon was made and is presented in Table 5.12.3.

Based on a Nuff Canyon reserve of 40 million tons of mineral aggregate and using extraction rates of 400,000 and 500,000 tons/year (range of actual annual extraction), the quarry has a projected life-span of between 80 and 100 years. The average market value of materials mined in Nuff Canyon was assumed to be \$5.50 per ton (1988 dollars) (Mac Carpenter, pers. com., February 1988). Using these values, the market value of materials mined at Pilarcitos Quarry in 1988 would be \$2.2 million (assuming 400,000 tons). Applying a 4 percent annual inflation factor, the total market value of the quarry material remaining in Nuff Canyon is between \$1.58 and \$2.83 billion, depending on the annual extraction rate used.

The filling of the northern portion of Nuff Canyon would prevent access to the mineral resources in this area. Estimates from quarry planners are that 20 to 25 million tons of mineable material would become unavailable (Mac Carpenter pers. com., February 1988). Thus, the quarry operation could remove an estimated 15 to 20 million tons of material and could continue to operate for 30 to 50 years.

Based on these assumptions (dependent on the extraction rate), \$160 million to \$349 million (market value at 4 percent per year inflation) of mineral resource would remain available. Landfill construction would prevent access of an estimated \$1.3 billion to \$2.6 billion of mineral resources.

Table 5.12-3. Estimated Value of Nuff Canyon Mineral Resource (Pilarcitos Quarry)

	Extraction Rate (tons/year) ¹	
	<u>400,000</u>	<u>500,000</u>
Estimated quarry life (years)	100	80
1988 resource value ² (million)	\$2.2	\$2.75
Estimated total quarry value ³ (billion)	\$2.83	\$1.58
Estimated quarry life with Nuff Canyon Project ⁴ (years)	38-50	30-40
Total value of resource available with Nuff Canyon Project ⁵ (million)	\$197-\$349	\$160-\$272
Total value of mineral resource lost with Nuff Canyon project (billion)	\$2.5-\$2.6	\$1.3-\$1.4

-
1. Upper and lower range of extraction rates
 2. Based on market value of \$5.50/ton
 3. 1988 market value applying 4 percent annual inflation factor
 4. Resource estimated to be accessible is 15 to 20 million tons
 5. Calculations with a base annual value using 1988 dollars and applying a 4 percent inflation factor for the years of operation

e. No Action

Under this alternative, landfill construction would not occur in Apanolio Canyon and either an alternate in-county site or existing out-of-county landfill would be identified for the County's solid waste disposal. Costs for landfill construction at an alternate site would be evaluated upon identification of the proposed site. Additional tipping fees

and transportation costs associated with disposal at an existing out-of-county facility are discussed further in Section 3.4, Site Evaluation.

f. Mitigation Measures

No mitigation measures are suggested at this time.

5.13 Cumulative Impacts

Water Quality

Establishment of the proposed landfill in Apanolio Canyon could add to existing degradation of ground and surface water resources in the project area. The ground water quality in a portion of Corinda Los Trancos Canyon has been impacted by operation of the existing landfill by increasing the concentration of total dissolved solids near the toe of the landfill. Expansion of landfill operations into Apanolio Canyon could further increase ground water impacts in the Pilarcitos Creek watershed. Erosion resulting from project construction and operation would add to the degradation of surface water quality in the Pilarcitos Creek watershed primarily by increasing turbidity levels in Apanolio Creek and downstream segments of Pilarcitos Creek (see Section 5.2, Hydrology and Water Quality).

Biology

Construction and operation of the proposed project would result in the removal of vegetation and associated wildlife habitat from the project area. An estimated 8 to 11 acres of riparian woodland, which includes 3.43 acres of wetland, and approximately 277 acres of upland habitat would be destroyed. Additionally, approximately 4,649 feet of trout habitat would be eliminated. Although off-site mitigation would technically

compensate for habitat losses, the destruction of naturally occurring habitat relatively removed from human activities, would add to cumulative habitat losses through urban expansion and construction activities.

Traffic

The proposed project would continue to contribute to the traffic volumes on Highway 92 as are currently imposed by the Corinda Los Trancos Canyon landfill operations. Truck related impacts to traffic flow along this route would continue until the landfill reaches capacity and San Mateo County's solid waste is diverted to other locations for disposal. Traffic congestion currently being experienced on Highway 92 should be temporarily lessened by proposed road improvements scheduled for completion by 1995. As population increases in the project area (i.e., Half Moon Bay) and nearby areas on the western side of the Coastal Range, daily traffic volumes on Highway 92 will increase and traffic conditions will continue to worsen.

Air Quality and Noise

The increase in truck traffic to the landfill and the continued addition of air emissions from vehicles and landfill activities (e.g., fugitive dust) would be slight in future years. However, these impacts would add to similar impacts from development and other activities in the project vicinity as population expansion continues.

5.14 Unavoidable Adverse Impacts

Construction and operation of the proposed landfill in Apanolio Canyon would result in several significant unavoidable adverse impacts. These

impacts would be significant in magnitude on the resource, and are long-term or permanent in duration.

Geology

The natural landform of Apanolio Canyon would be permanently altered. Project construction would remove existing overburden materials in the canyon to be used, in conjunction with solid waste, to construct the lifts of the landfill. The project would fill the canyon, replacing the existing topography with a terraced landfill face and a landfill surface with a final perimeter elevation of approximately 1,200 feet.

Biology

Approximately 285 acres of wildlife habitat and associated vegetation would be removed during the life of the project. Habitat loss would include an estimated 3.43 acres of *Corps designated* wetland. Approximately 5,600 feet of Apanolio Creek, a perennial stream with 4,649 feet of resident trout habitat would be filled and replaced with drainage structures. Off-site mitigation would lessen this impact; however, loss of naturally occurring habitat in Apanolio Canyon would not be reversible.

Water Quality

If the engineered landfill liner and leachate collection system fail to contain leachate from the operations, contaminants could enter the surface or ground water system. Unless an effective contingency plan can be implemented in the event of such a liner failure, these contaminants could adversely impact downstream beneficial uses including domestic and agricultural water supplies, a potential municipal supply and maintenance of

streamflows and the beneficial uses related to this watercourse (see Section 5.2, Hydrology and Water Quality, for discussion of impacts and mitigation).

Other Topical Areas

Impacts to air quality, traffic, aesthetics, public health and safety, and cultural resources would not be significant or could be effectively mitigated by the proposed project mitigations.

5.15 Short-Term Uses vs. Long-Term Productivity

Establishment of a large capacity landfill in Apanolio Canyon would be a commitment by the County of San Mateo for a long-term disposal site. The establishment of a single large capacity facility, with the significant environmental impacts identified in Section 5.14, would prevent environmental degradation of several smaller alternative sites within or outside San Mateo County. Since smaller capacity sites other than the proposed alternatives have not been identified, comparison of the environmental impacts of these smaller facilities cannot be addressed at this time. *Long-term protection of downgradient beneficial uses would be ensured through permit requirements to protect water quality and quantity. Thus, future land uses downgradient from the project area (e.g., agricultural and residential development) would be protected.*

Resource recovery programs are currently underway in San Mateo County and additional programs are proposed for implementation in the future. Volume reduction in solid waste would extend the life-span of the proposed facility. Resource recovery could extend landfill life beyond 93 years. Impacts to the natural environment would result from project implementation

while San Mateo County would be assured of a means of solid waste disposal well into the future.

5.16 Irreversible/Irretrievable Commitments of Resources

The proposed action would alter the natural condition of Apanolio Canyon and Apanolio Creek. The loss of of 8 to 11 acres of riparian woodland, including an estimated 3.43 acres of wetland, *4,649 feet of resident rainbow trout habitat*, and approximately 277 acres of upland vegetation in its remote, relatively unaffected state would be mitigated, but would be permanently lost in Apanolio Canyon. Therefore, the nature of the wildlife habitat in the canyon would be modified, and upon final closure of the landfill, the type of habitat established through revegetation would be different from that currently existing. The habitat value of the surrounding canyon area would be degraded from intrusion of project activities (e.g., truck and landfill equipment operation).

6.0 CONSULTATION AND COORDINATION

National Environmental Policy Act

The National Environmental Policy Act (NEPA) of 1970, and subsequent amendments, is the basic national charter for protection of the environment. The Act establishes goals and provides means for carrying out the intent of the policy. The public document used to address the environmental issues related to a proposed action (i.e., project) is an environmental impact statement (EIS).

The upholding of the intent and spirit of the Act requires a process of interaction between the Lead Agency and other public agencies, private citizens, and organizations to identify environmental concerns. A brief summary of the actions taken by the Lead Agency (i.e., U.S. Army Corps of Engineers) and interested officials is provided in the following sections.

6.1 Public Involvement

Public Notice and Scoping for EIS Preparation

The U.S. Army Corps of Engineers (Corps) public involvement and review process for the proposed project began *June 8, 1987, with the release of* Public Notice No. 16611S91. This notice was issued by the Corps upon review of an application by the proponent for a permit to fill a portion of Apanolio Creek, an action regulated under section 404 of the Clean Water Act. The Corps staff prepared a preliminary environmental assessment (PEA) for the proposed action and distributed the PEA as part of the public notice. A recommendation stated in the PEA concluded that an EIS would be

prepared for the project. The comment period for citizens and public agencies to respond was 30 days from the date of the Public Notice. A listing of those responding is provided in Table 6.1-1 and comment letters are included in Appendix A.

A notice of intent (NOI) to prepare an EIS for the Apanolio Canyon expansion was published in the Federal Register on August 18, 1987. This notice described the proposed action, alternatives, and public scoping process. A copy of the NOI and agency response is provided in Appendix A. On September 3, 1987, from 9 a.m. to 11 a.m., a public scoping session was directed by the U.S. Army Corps of Engineers at 211 Main Street, San Francisco, California. This scoping session was noticed in the NOI. The agencies and individuals represented in this meeting are listed in Table 6.1-2.

Table 6.1-1. Agencies and Citizens Commenting on Public Notice

Agencies:

Federal

- U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service, Southwest Region
- U.S. Environmental Protection Agency, Region IX
- U.S. Department of the Interior
Fish and Wildlife Service
Division of Ecological Services

State

- The Resources Agency of California (attachments)
California Department of Fish and Game
California Department of Parks and Recreation
- California Coastal Commission
- California Regional Water Quality Control Board
San Francisco Bay Region

Organizations:

- Sierra Club Urban Creeks Task Force

Citizens:

- Ronald D. Bongard, Apanolio Canyon property owner
- Iolanda Berta and Raymond Chiesa, G. Berta Vegetable Growers
- Dino Anderotti, Sr. and Dino E. Anderotti, Jr., Apanolio Canyon property owners/farmers
- Gilbert B. and Ferne E. Gossett, Apanolio Canyon property owners

Table 6.1-2. Representation at September 3, 1987 Scoping Session

- U.S. Army Corps of Engineers
- California Regional Water Quality Control Board
- California Coastal Commission
- San Mateo County
- Browning-Ferris Industries of California, Inc.

6.2 Agency Contact and Coordination

Proposed Project Agency Meetings

In 1983, an Environmental Impact Report (EIR) was prepared for the Apanolio Canyon expansion, by Thomas Reid Associates, to comply with the requirements of the California Environmental Quality Act (CEQA). Since the distribution of the Draft EIR in October 1983, many studies and meetings with appropriate agencies have been conducted. A brief summary of these activities is presented in Table 6.2-1.

Table 6.2-1. Agency Interaction and Coordination

Month	Contact/Action
May 1983	- Corps responds to NOP for EIR for the Apanolio Canyon Landfill Expansion, and informs San Mateo County that the project may need Section 404 (Clean Water Act) approval.
October 1983	- Draft EIR for the Apanolio Canyon Landfill Expansion Project issued and circulated to all local, state, and federal agencies.
February 1984	- Apanolio Canyon EIR certified by San Mateo County. - Land Use Permit for Apanolio Canyon issued. - Apanolio Canyon Coastal Development permit issued. - Final Apanolio Canyon EIR states in Chapter II on page II-1, that a Corps 404 permit would be required for the discharge of fill material in Apanolio Creek.
June 1986	- Report of Waste Discharge for Apanolio Canyon submitted to the Regional Water Quality Control Board (RWQCB).
August 1986	- Apanolio Canyon Grading Permit issued. - Resource agencies and Corps of Engineers make site inspection with applicant and consultants.
September/ October 1986	- California Department of Fish and Game (CDFG) meet with BFI consultants to conduct fishery survey at the site.
October 1986	- California Department of Forestry and Fire Protection (CDFFP) discuss burn projects in Apanolio Canyon at the site. - EPA, CDFG, U.S. Fish and Wildlife Service (USFWS), and BFI consultants conduct site review.
November 1986	- CDFG measures flows in Apanolio Creek.

- January 1987 - CDFFP and San Francisco Water District (SFWD) discuss burn projects in Apanolio Canyon.
- February 1987 - BFI files nationwide permit notification letter with the Corps. Submittal includes report by Harding Lawson Associates regarding wetland acreage (3.26 acres).
- CDFFP and Bay Area Air Quality Management District (BAAQMD) discuss burning and air quality issues.
- March 1987 - Corps of Engineers determines that a nationwide permit is not applicable for Apanolio Canyon project expansion since conditions prohibiting jeopardy of an endangered species and prohibition of significant disruption of movement of aquatic life indigenous to the waterway (i.e., steelhead trout) were not met.
- March/April/
September 1987 - CDFG conducts fishery and snake surveys at the site.
- March/April/
October 1987 - CDFG conducts mitigation review at the site.
- March 1987 - Corps rejects applicability of "headwaters" nationwide permit and determines that it has jurisdiction over 3.43 acres of wetlands.
- BFI meets with Corps and County representatives to discuss the section 404 permit application.
- April 1987 - BFI files the section 404 permit application, including mitigation proposal.
- Corps holds state and federal interagency meeting to discuss Apanolio Canyon Landfill Expansion Project.
- May 1987 - Water sampling conducted by CDFG.
- BFI meets with State Water Resources Control Board in Sacramento to discuss ability to mitigate adverse environmental effects of project.
- June 1987 - Corps publishes Public Notice No. 16611S91.
- State Water Resources Control Board determines that on-site mitigation can offset loss of beneficial uses.

- July 1987
- BFI meets with staff of USFWS Regional Office (Portland) to refute Service's reclassification of Apanolio Creek as Resource Category 1.
 - Endangered species evaluation performed by USFWS.
 - Point Reyes Bird Observatory staff conduct survey for Marbled Murrelett at Apanolio Canyon site.
- August 1987
- BFI files Alternative Analysis with the Corps.
 - BFI and Corps meet to begin the EIS process.
 - Interagency meeting held in Sacramento to discuss issues, permit review, and permitting schedule for Apanolio Canyon project. See Table 6.2-2.
 - BFI meets with staff of USFWS' Sacramento office to refute Service's reclassification of Apanolio Creek as Resource Category 1.
- September 1987
- EIS public scoping meeting held at Corps office in San Francisco.
 - RWQCB expresses to County that the best available engineering design at the time will be accepted as best standard for landfill - Meeting comments noted in memorandum sent to Roger James (Executive Officer) in October 1987.
 - County letter to Corps identifying Apanolio Canyon as the preferred alternative for landfill expansion in San Mateo County.
 - Distribution of proposed Santa Clara County Solid Waste Management Plan amendment regarding guidelines for allowing importation of solid waste from out-of-county jurisdictions.
- October 1987
- Santa Clara Solid Waste Technical Advisory Committee meeting - Alameda and Santa Clara Counties and RWQCB present; both Alameda and Santa Clara Counties convey reluctance to accept refuse from San Mateo County.
 - Letter from California Waste Management Board to RWQCB expressing urgency in developing waste discharge requirements for Apanolio Canyon.

- BFI, County, and elected officials meet with USFWS in Washington D.C. to discuss Resource Category and mitigation for Apanolio Creek.
- November 1987 - San Francisco garter snake study concludes June-November trapping efforts with no findings.
- December 1987 - San Mateo/Santa Clara Task Force to discuss landfill expansion.

To further define agency concerns and coordinate efforts for permit review and processing, an interagency meeting was held in Sacramento, California on August 26, 1987. Agency representatives attending this meeting are listed in Table 6.2-2.

Table 6.2-2. Agency Representatives Attending August 26, 1987 Meeting.

<u>Agency</u>	<u>Representatives</u>
Federal Agencies	
<u>U.S. Army Corps of Engineers</u>	Colonel Galen Yanagihara Calvin Fong Dave Hodges Barney Opton
<u>U.S. Fish and Wildlife Service</u>	Cay Collette Goude James Carson
State Agencies	
<u>California Water Quality Control Board</u>	Harry Schueller
<u>California Regional Water Quality Control Board - S. F. Bay Region</u>	Roger James Ken Thiesen
<u>California Department of Fish and Game</u>	Pete Bontadelli
<u>California Waste Management Board</u>	Jim Calloway Don Dier, Jr.

Officials: Assemblyman Bill Duplissee
Assemblywoman Jackie Speir
Representative for Congressman Konnyu
Representative for Senator Becky Morgan

Local Agencies

County of San Mateo

Supervisor Tom Nolan
Bill Rozar
Paul Scannell

Private

Browning Ferris Industries
of California, Inc.

Lino Valbusa
Dan Day

Bay Relations

Adrienne Tissier

7.0 BIBLIOGRAPHY

7.1 References

Association of Bay Area Governments, 1987. Projections '87, April.

Borcherdt, R. D., J. F. Gibbs, and K. R. Lajoie, 1986, Map Showing Maximum Earthquake Intensity Predicted in the Southern San Francisco Bay Region, California, for Large Earthquakes on the San Andreas and Hayward Faults. U.S. Geological Survey, Miscellaneous Field Studies Map MF-709.

Caltrans (California Department of Transportation), 1986. 1986 Traffic Volumes on California State Highways.

Cooper Clark & Associates, 1975, Geotechnical Services - Proposed Corinda Los Trancos Sanitary landfill, Ox Mountain, San Mateo County, California. Prepared for San Mateo County Scavenger Company.

Dewalle, F. B., E. S. K. Chain, and E. Hammerberg, 1978, Gas Production from Solid Waste in Landfills. Journal of The Environmental Engineering Division, June, 1978.

EMCON Associates, 1987, Ground-water and Surface-water Monitoring Report for the Corinda Los Trancos Landfill, September. Prepared for Browning-Ferris Industries of California, Inc.

Employment Development Department, 1986. Annual Planning Information, Lassen County 1986-1987, May.

Harding Lawson Associates, 1976, Oceanographic Study, Reconnaissance Phase Report-Santa Cruz Wastewater Facilities Planning Study. Volume II, Geotechnical Study. Prepared for Brown and Caldwell, Consulting Engineers.

Harding Lawson Associates, 1986, Geotechnical Investigation - Santa Cruz Ocean Outfall, Santa Cruz, California. Prepared for Brown and Caldwell, Consulting Engineers.

Harding Lawson Associates, 1987, Wetlands Assessment, Ox Mountain Landfill Expansion, San Mateo County, California, February. Prepared for Browning-Ferris Industries of California, Inc.

Hydrocomp, Inc., 1988, Storm Runoff and Sediment Management at the Apanolio Canyon Landfill, January. Prepared for Browning-Ferris Industries of California, Inc. and Brian-Kangas-Foulk and Associates.

Jennings, C. W., 1975, Fault Map of California. California Division of Mines and Geology.

Lone Star Industries, Inc., 1973, Environmental Impact Report, Pilarcitos Plant #138, June.

Martin Carpenter Associates, 1985, Reclamation Plan for the Piombo Corporation, Pilarcitos Quarry, San Mateo County, California, May.

PRC Engineering, 1985, Pilarcitos Rock Quarry Traffic Impact Study, September. Prepared for Piombo Corporation.

PRC Voorhees, 1982, Truck Access Study for Ox Mountain Disposal Site, May. Prepared for San Mateo County.

Purcell, Rhoades & Associates, 1986, Geotechnical Investigation and Preliminary Landfill Design - Apanolio Canyon Expansion Site. Prepared for Browning-Ferris Industries of California, Inc.

Purcell, Rhoades & Associates, 1987, 1987 Water Quality Data, Corinda Los Trancos Landfill, Ox Mountain, San Mateo County, California, August.

Purcell, Rhoades & Associates, 1987, Water Monitoring Data, May through September, 1987, Apanolio Canyon Expansion Site, Ox Mountain, San Mateo County, California. Prepared for Browning-Ferris Industries of California, Inc., October.

Purcell, Rhoades & Associates, 1987a, Supplemental Response to the Completeness Check List, and Attached Comments for the Report of Waste Discharge (ROWD), Proposed Apanolio Canyon Expansion Site, Ox Mountain, San Mateo County, California. Prepared for California Regional Water Quality Control Board, March.

Purcell, Rhoades & Associates, 1987b, Results of Angle Drilling Program - Apanolio Canyon Expansion Site, San Mateo County, California. Prepared for Browning-Ferris Industries of California, Inc., May.

Purcell, Rhoades & Associates, 1987c, Replacement Ground-water Monitoring Well Installation Report, Corinda Los Trancos Landfill, Ox Mountain, San Mateo County, California. Prepared for Browning-Ferris Industries of California, Inc., June.

Purcell, Rhoades & Associates, 1987d, Results of MW-Series Ground-water Monitoring Well Drilling Program, Apanolio Canyon Expansion Site, Ox Mountain, San Mateo County, California. Prepared for Browning-Ferris Industries of California, Inc., December.

Purcell, Rhoades & Associates, 1988, Revised Hydrological Assessment and Water Resources Beneficial Usage Analysis, Apanolio Canyon Expansion Site, Ox Mountain, San Mateo County, California. Prepared for Browning-Ferris Industries of California, Inc., January.

Rante, S. E., 1968, Average Annual Precipitation and Precipitation-depth-duration-frequency Data for the San Francisco Bay Region, California, U.S. Geological Survey.

Reiser, D. W. and T. C. Bjornn, 1979, Influence of Forest and Rangeland Management on Anadromous Fish Habitat in the Western United States and Canada, USDA Forest Service General Technical Report PNW-96.

San Mateo County Department of Environmental Management, 1985a. Community Development, General Plan Hearing Draft, November.

San Mateo County Department of Environmental Management, 1985b. Overview and Resource Management, General Plan Hearing Draft, November.

San Mateo County Department of Environmental Management, 1985c. San Mateo County Local Coastal Program Policies, November.

San Mateo County Department of Public Works, 1984. Solid Waste Management Plan for San Mateo County, April.

Thomas Reid Associates, 1984, Ox Mountain Sanitary Landfill, Apanolio Canyon Extension, Final Environmental Impact Report. Prepared for San Mateo County, California.

Thomas Reid Associates and Fehr & Peers Associates, 1986. Ox Mountain Sanitary Landfill, San Francisco Solid Waste Amendment, Draft Supplemental Environmental Impact Report, November. Prepared for San Mateo County.

Thomson, J. M. and J. F. Evernden, 1986, Map Showing Predicted Seismic-Shaking Intensities of an Earthquake in San Mateo County, California, Comparable in Magnitude to the 1906 San Francisco Earthquake, U.S. Geological Survey, Miscellaneous Investigations Series Map 1-1257-H.

Torrey & Torrey, Inc., 1983, Acme Landfill Expansion, Final Environmental Impact Report/Environmental Impact Statement. Prepared for Contra Costa County Planning department and U.S. Army Corps of Engineers. 2 vol.

U.S. Army Corps of Engineers, San Francisco District, 1978, Maacama Fault Study - Sonoma and Mendocino Counties, California.

Wilsey, Ham & Blair, 1963, Waste Disposal Site Survey for San Mateo County, January. Prepared for the San Mateo County Board of Supervisors.

7.2 Personal Communications

Bee, Michael, Environmental Management Analyst, San Mateo County, Redwood City, California.

Carpenter, Malcolm, Principal, Martin Carpenter Associates, San Carlos, California.

Day, Dan, Assistant District Manager, Browning-Ferris Industries of California, Inc., San Carlos, California.

Eagen, Rod, Sergeant, San Mateo County Sheriff's Department, Redwood City, California.

Knickelbein, Mike, Caltrans, District 4, San Francisco, California.

Laakso, George, San Mateo County Public Works Department, Redwood City, California.

Lew, Lorraine, Environmental Health Specialist, San Mateo County Office of Environmental Health, Redwood City, California.

Murphy, Bruce, Director, Environmental Services, Purcell, Rhoades & Associates, Hayward, California.

Rozar, William, Senior Planner, San Mateo County Planning Department, Redwood City, California.

Sargent, Debbie, Browning-Ferris Industries of California, Inc., San Carlos, California.

8.0 LIST OF PREPARERS

The following firms and persons participated in the preparation of the Draft EIS.

Harding Lawson Associates
7655 Redwood Boulevard
Novato, California 94948
415/892-0821

Michael J. Sotak
Principal Env. Specialist

M.S. Biology, 1968
B.A. Biology, 1964

Project Director, NEPA Requirements

Michael J. Zander
Principal Env. Specialist

M.A. Applied Plant Taxonomy, 1980
B.A. Biological Sciences, 1975

Technical Advisor, Biology

David L. Watkins
Env. Specialist

M.S. Environmental Pollution Control, 1985
B.S. Environmental Science, 1982

EIS Project Manager, Project Description,
Traffic, Noise

Leslie J. Zander
Biologist

B.A. Biology, 1980

Biology

Roland A. Sanford
Senior Env. Specialist

M.S. Environmental Engineering, 1984
B.S. Fisheries Biology, 1982
B.A. Biology and Zoology, 1982

Hydrology, Water Quality, Aquatic
Resources

Roy C. Skinner
Senior Geologist

B.S. Geology, 1983

Geology, Public Health and Safety, Air
Quality

Maria Cipriani
Env. Planner

B.S. Landscape Architecture, 1981

Public Facilities and Services, Cultural
Resources, Aesthetics, Land Use Plans and
Policies, Economics

U.S. Army Corps of Engineers
San Francisco District
211 Main Street
San Francisco, California 94105
415/974-0429

Barney Opton
EIS Coordinator

David Hodges
EIS Review, Section 404 Permit Officer

Skid Hall
EIS Review

Lars Forsman
EIS Review

Larry Vinzant
EIS Review

The following firms and persons contributed to preparation of the EIS by providing background information and studies, project design and mitigation packages.

Purcell, Rhoades & Associates

Daniel Rhoades, P.E.
Principal

MBA, 1959
M.S., Civil Engineering, 1957
B.S., Civil Engineering, 1956

John Hicks, P.E.
Special Projects Manager

B.S., Civil Engineering, 1977

Bruce J. Murphy
Associate

B.S., Geological Engineering, 1975

Brian Kangas Foulk

Tony Gschwend
Principal

M.S., Civil Engineering, 1970
B.S., Civil Engineering, 1969

William Melgar
Project Engineer

B.S., Civil Engineering, 1968

Hydrocomp, Inc.

Norman H. Crawford
President

Ph.D., Hydraulics & Hydrology, 1962
M.S., Hydraulics, 1959
B.S., Civil Engineering, 1958

Ralph Osterling Consultants, Inc.

Ralph Osterling

B.S., Forest Management, 1966

Richard Sampson

B.S., Forestry, 1983

9.0 DRAFT DEIS REVIEW

9.1 Introduction

The public involvement process for the EIS for the Ox Mountain Sanitary Landfill, Apanolio Canyon Expansion Site by the Corps of Engineers began in June, 1987. Through a formal noticing process and scoping period, the Corps received comment from agencies and the public regarding the concerns and potential impacts to the environment that may be generated by the proposed project. These comments were used as a guide in preparing the Draft EIS and were contained in Appendix A of the Draft.

Approximately 200 copies of the Draft EIS were distributed to federal, state, and local agencies, community and other interest groups, and private citizens for review. The 45-day comment period for submittal of written comment on the content of the Draft EIS ended on July 18, 1988. To further invite public comment on the EIS, the Corps conducted a public hearing on July 7, 1988 in Redwood City, California. The following sections present and respond to comments received through this public review process.

9.2 Comment Letter Overview

The Corps of Engineers received 34 letters of commentary on the Ox Mountain Sanitary Landfill, Apanolio Canyon Expansion Site Draft EIS during the public review period. A list of the comment letter authors (e.g., agency, private organization, or individual) is provided in Table 9.2-1. These comment letters are presented in Section 9.4. All substantive comments on the DEIS within these letters are identified by a number which corresponds with a response to that comment. Comments are numbered by letter (each letter receiving a number) and a comment number within that letter.

Responses to comments are presented as references to revised sections within the body of the EIS, references to other (similar) comments and as individual written responses to the comment. Revised sections within the EIS, to present additional information that has become available since the publication of the Draft EIS, are presented in italic print.

Table 9.2-1. Comment Letters Received on DEIS.

<u>Letter Number</u>	<u>Source</u>
1	Office of Historic Preservation, Department of Parks and Recreation (State Agency)
2	Bay Area Air Quality Management District (BAAQMD) (State Agency)
3	Association of Bay Area Governments (ABAG) (Local Agency)
4	Department of Health and Human Services (State Agency)
5	Meredith/Boli & Associates, Inc. (Private Company)
6	Karen Garrison (Urban Creeks Council and Northern California Council Federation of Flyfishers) (Organization)
7	Supervisor Tom Huening (San Mateo County) (Local Agency)
8	California Sportfishing Protection Alliance (Organization)
9	Ronald D. Bongard (Resident)
10	The Peninsula Fly Fisheries, Inc. (Organization)
11	Piombo Construction Company (Private Company)
12	Dennis M. and Laurie H. Marsh (Residents)
13	Nan Scott (Resident)
14	U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service (Federal Agency)
15	James H. Reynolds (Resident)
16	Northern California Council Federation of Fly Fishers (Organization)
17	Thomas G. Kilfoil (Resident)

- 18 County of San Mateo, County Manager (Local Agency)
- 19 Louis S. Wall (Resident)
- 20 Meredith/Boli & Associates, Inc. (Private Company)
- 21 California Regional Water Quality Control Board (State Agency)
- 22 United States Environmental Protection Agency, Region IX (Federal Agency)
- 23 United States Department of the Interior, Office of Environmental Project Review (Federal Agency)
- 24 Committee for Green Foothills (Lennie Roberts, Legislative Advocate) (Organization)
- 25 Biological Photo Service (Private Company)
- 26 California Trout (Organization)
- 27 California Coastal Commission (State Agency)
- 28 John E. Powell (Resident)
- 29 American Fisheries Society (Organization)
- 30 Sierra Club, Loma Prieta Chapter (Organization)
- 31 Sierra Club, Loma Prieta Chapter (Organization)
- 32 Waste Management of North America, Inc. (Private Company)
- 33 USACE, South Pacific Division (Federal Agency)
- 34 The Resources Agency of California (State Agency)

9.3 Public Hearing Overview

A Corps of Engineers public hearing on the Draft EIS was held in the San Mateo County Board of Supervisors Chambers, Hall of Justice, Redwood City, California, on July 7, 1988. The intent of this hearing was to obtain oral comments from members of the public and agency representatives on the

adequacy of the content of the Draft EIS. A public hearing is often used as a method of inviting comments on a draft statement as required by NEPA (Section 1503.1). The public hearing was lead by Colonel Galen H. Yanagihara, U.S. Army Corps of Engineers, San Francisco District. Introductory information presented at this hearing included Corps permit history and schedule, as well as a presentation of the proposed action by representatives of Browning Ferris Industries of California, Inc.

A list of the persons presenting oral comments at the hearing is provided in Table 9.3-1. The public hearing comment and response portion of this document (Section 9.5) contains a summary of the official transcripts for the hearing and the response to the issues raised. This chapter presents a summary of the comments, and responses to any substantive issues regarding the DEIS are provided. The public hearing transcripts have not been reprinted in the Final EIS because they are part of the public record. Copies of the hearing transcripts are available for review at the U.S. Army Corps of Engineers, San Francisco District, 211 Main Street, San Francisco, California.

Table 9.3-1. Persons Presenting Oral Comment
at July 7, 1988 Public Hearing

<u>Speaker Number</u>	<u>Name</u>	<u>Title</u>
1	Tom Nolan	Supervisor San Mateo County
2	William J. Schumacher	Supervisor San Mateo County
3	Paul T. Scannell	Assistant County Manager San Mateo County
4	Lewis Roe	Resident San Mateo County
5	David Nakayama	Field Representative for Assemblywoman Jackie Speier
6	Paul Formosa	South San Francisco Scavenger Company

7	A.G. Fannucci	Resident San Mateo County
8	Vincent Cozzolino	Resident Businessman San Mateo County
9	Hank Sciaroni	Resident San Mateo County
10	Joseph J. Zucca	Resident San Mateo County
11	Mary Griffin	Supervisor San Mateo County
12	Mario Torrigino	Coastside Scavenger Company
13	Gilbert Gossett	Resident San Mateo County
14	Karen Miller	Wildlife Biologist U.S. Fish & Wildlife Service, Sacramento
15	James Hamilton	California Trout San Francisco
16	Joseph Bergeron	Planning Commission Member San Mateo County
17	Henry Bostwick, Jr.	Executive V.P. and General Manager San Mateo County Development Association
18	Albert Teglia	Council of Mayors San Mateo County
19	Michael Mahoney	Administrative Assistant for Assemblyman Duplissea
20	Karen Garrison	Urban Creeks Council and Northern California Federation Council of Flyfishers

21	Judith Goldsmith	Resident San Mateo County
22	Ann Schneider	Sierra Club Representative
23	Steve Kiss	Resident San Mateo County
24	Nan Scott	Resident San Mateo County
25	Peg Gunn	Council Member City of Menlo Park
26	Pat Bennie	Resident San Mateo County

9.4 Comment Letters and Responses

The comment letters received on the Draft EIS are presented in the sequence that they appear in Table 9.2-1. Responses to comments identified in these letters follow in the same sequence.

OFFICE OF HISTORIC PRESERVATION

DEPARTMENT OF PARKS AND RECREATION

P.O. BOX 94286
SACRAMENTO, CALIFORNIA 95834-0286
916-441-8406



23 June 1988

Reply to: COE 880525A

Lt. Col. Andrew M. Perkins, Jr.
District Engineer
US Army Corps of Engineers
211 Main Street
San Francisco, California 94105
attention: Barney Opaton

Subject: Ox Mountain Sanitary Landfill/Apanioli Canyon Site, San Mateo County

We recently received a copy of the COE Draft EIS referenced above.

Compliance with Section 106 of the National Historic Preservation Act and 36 CFR 800 is mandatory for any undertaking which is permitted, funded, initiated, or assisted by a federal agency, or which takes place on lands under federal ownership or jurisdiction. Because it requires a COE permit, your proposal falls under this requirement.

Federal law also requires that our office review such undertakings for potential effects to significant archaeological or historical resources. To complete this review, we need additional information from you.

Please forward a copy of the original archaeologist's report which identifies the potential for your project to damage significant archaeological properties. You should also include photographs of any building or other structure which appears to be more than fifty years old and which will be altered or demolished by your project.

If you have any questions, please telephone Nicholas Del Cioppo of my staff at (916) 322-4419.

Sincerely,

Kathryn Gualtieri
Kathryn Gualtieri
State Historic Preservation Officer

(enclosure)

cc: State Clearinghouse



BAY AREA AIR QUALITY MANAGEMENT DISTRICT

June 24, 1988

Department of the Army
San Francisco District, Corps of Engineers
211 Main Street
San Francisco, CA 94105-1905

Attention: Colonel Galen H. Yanagihara
District Engineer

Dear Colonel Yanagihara:

We have reviewed the Draft EIS for the Ox Mountain Sanitary Landfill Expansion Site. The project consists of the expansion of the existing Ox Mountain Sanitary Landfill into Apollonio Canyon. The expansion would have a capacity of 123.7 million cubic yards and would have an estimated lifespan of approximately 93 years. Apollonio Canyon is located approximately 3 miles northeast of Half Moon Bay and is adjacent to the existing Corinda Los Trancos Canyon landfill.

The DEIS estimates that landfill operations could generate approximately 5,450 lbs./day of particulate matter. However, the DEIS does not address potential compliance problems (due to particulate emissions) with ambient air quality standards or BAAQMD regulations, including, but not necessarily limited to, Regulation 2.2 (New Source Review) and Regulation 6 (Particulate Matter and Visible Emissions). We recommend that the Final EIS discuss in greater detail the impact of particulate emissions on ambient air quality and compliance with applicable District regulations. If you have questions regarding BAAQMD regulations, please contact Craig Ullery of our Permit Services Division at (415) 771-6000.

In order to mitigate particulate emissions, the DEIS recommends that haul roads be watered during periods of high dust generation. Please note that for new landfills we are currently requiring that all haul roads be paved.

Page 5-56 of the DEIS states that refuse must be covered daily with soil in order to minimize odor problems only if deemed necessary by the San Mateo County Office of Environmental Health. Please note that as a condition of permit approval, the BAAQMD has been requiring all new landfills to cover refuse daily with soil.

The DEIS's analysis of landfill gases addresses methane emissions and odors, but does not discuss potential emissions of toxic air contaminants from materials deposited (either legally or illegally) in the landfill. We recommend that the Final EIS discuss the potential for toxic air emissions from the landfill, and the impact on landfill employees, patrons and neighbors. Of course, appropriate mitigation measures also should be discussed.

939 ELLIS STREET • SAN FRANCISCO, CALIFORNIA 94109 • (415) 771-6000

Colonel Galen H. Yanagihara
Department of the Army
June 24, 1988
Page Two

2-5

Page 2-14 of the DEIS states that landfill operations would require a BAAQMD Permit to Operate. Please note that the landfill gas collection system would also be subject to BAAQMD permit requirements. We suggest that a representative of Browning Ferris Industries contact Craig Ullery at the number given above for details.

If you have any other questions, please contact Jean Roggenkamp, the Planner in our office.

Sincerely,

Milton Feldstein
Air Pollution Control Officer

MF:HH:ml

cc: S. Germain, ABAG



ASSOCIATION OF BAY AREA GOVERNMENTS

Mailing Address: P.O. Box 2050 Oakland CA 94604-2050

June 23, 1988

Colonel Galen H. Yanagihara
District Engineer
U.S. Army Corps of Engineers
San Francisco District
211 Main Street
San Francisco, CA 94105

RE Draft Environmental Impact Statement for Proposed Expansion of
Ox Mountain Landfill (Regulatory Permit Application No. 166115911)

Dear Colonel Yanagihara:

Thank you for the opportunity to submit staff comments regarding the subject DEIS. The comments focus on regional issues not addressed in the DEIS and reflect concerns of Bay Area local elected officials that have been embodied in ABAG's Regional Plan for the San Francisco Bay Area. ABAG's Executive Board has not taken a position on this document nor on the proposed project.

3-1 This letter references and expands upon points cited in ABAG's July 7, 1988 response to the Notice of Preparation (not included in the response section of the DEIS)

1. Proper waste management and adequate land disposal capacities are regional environmental quality and public health issues as important as protection of natural resources.
2. The region as a whole will receive long-term benefits if San Mateo County is able to manage its own wastes internally.

State law makes each county and its cities responsible for the safe and environmentally sound management and disposal of all wastes generated within and disposed of within that county. Increasingly strict environmental controls over the location and operation of sanitary landfills, and intense public opposition to any landfill that is perceived to be near enough to threaten property values, have led all Bay Area counties--and their franchised operators--to look to remote canyons to meet their mandated responsibilities. Each county's first priority, under State law, is to provide for its own wastes for at least 20 years into the future. Whenever a county, as is the case with San Francisco, must take its wastes to another county, it not only reduces the receiving county's ability to accommodate its own population's needs but diminishes the capability of the region as a whole.

Representing City and County Governments of the San Francisco Bay Area
MetroCenter • Eighth & Oak Streets • Oakland • (415) 464-7900

June 23, 1988
Colonel Galen H. Yanagihara
Page Two

Browning-Ferris Industries, in cooperation with San Mateo County, purchased land comprising Corindo Los Trancos and Aponolito Canyons with the expectation that environmental impacts could and would be mitigated, and that the people of San Mateo County would have refuse disposal capacity well into the next century. It was even conceived that San Francisco, which has no capacity of its own and has had to export its garbage for decades, might send its refuse to Ox Mountain Landfill. With the Corps' identification of 3.43 acres of wetland that would be eliminated by the proposed project, BFI and San Mateo County have evaluated several additional potential sites in the county for purposes of this document. All would have similar environmental consequences to the proposed project, though in lesser degree and without providing comparable long-term capacity. Sites with additional undesirable effects--those whose access would be via Highway 1 and local streets in Half Moon Bay and that would be visible from urban areas--were eliminated from final consideration.

The following table shows the extent of affected habitats and capacity in years for the proposed project and the three alternatives examined in the DEIS.

Site	Aquatic Habitat	Wetlands	Riparian Woodlands	Upland Vegetation	Capacity - Years
Alt. 1 Aponolito Cyn. 800'	4200'	2.7 A	7-10 A	121 A	25
Alt. 2 Los Trancos forefill 3400'	3400'	1.5-2.0	4-5	93	16
Alt. 3 Muff Cyn. 4200'	4200'	2.0-2.5	5-7	112	27
Total Alts. 11800'	11800'	6.2-7.2	16-22	326	68
Proposed Project Aponolito Cyn. 1200'	5600'	3.43	8-11	277	93

The three alternative sites were totaled to show that if they were used consecutively their cumulative impact on habitat resources would be considerably greater than the proposed project without providing comparable long-term capacity.

Long-term land disposal capacity for wastes that must be landfilled is a critical regional environmental necessity. With many of the region's existing landfills closing, and since finding new sites which meet environmental criteria and public acceptance is increasingly difficult, the region's long-term disposal capacity is shrinking. Ultimately the entire region will depend upon large landfills in only three or four counties. In order to make this capacity last as long as possible, ABAG's policies support maximum reduction of wastes going to landfills through comprehensive waste reduction, recycling and resource recovery efforts. But landfills will still be necessary for as far into the future as we can see, not just 50 or 100 years.

June 23, 1988
Colonel Galen M. Yanagihara
Page Three

The potential for exporting San Mateo's wastes to another county is not promising. Possible receiving counties are concerned with maintaining capacity for their own populations. For both San Mateo and the receiving county, policies and plans would have to be amended; environmental documents would have to be prepared. The existing landfill operation will run out of space before these processes could be run. Costs to San Mateo County's homes and businesses would be greatly increased.

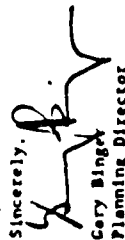
San Mateo County has undertaken an accelerated countywide recycling effort. The applicant proposes to meet water quality requirements and to mitigate habitat losses to the maximum extent feasible. For all the reasons cited above, we urge the Corps to weigh the regional--as well as local--environmental quality, public health and safety, and economic benefits of long-term waste disposal capacity against unavoidable impacts on biological resources in San Mateo County. We believe the best interests of the nine-county Bay Area would be served by attaching, to permit and project approvals, the following set of requirements and conditions:

- a) Protect water quality;
- b) Mitigate impacts on biological resources to the extent feasible; and
- c) Dramatically reduce wastes requiring landfilling through recycling and composting.

ABAC policies also support protection of lands suitable for solid waste landfill sites from future development. To that end, the further suggestion is offered that San Mateo County enact protections for the Huff Canyon site for use after the Aponoio Canyon site reaches capacity. This would allow full realization of the quarry's resource value undiminished by concurrent landfill operations.

I hope these comments are helpful. If you have questions please call Ed Wyatt at the ABAC offices. His direct line is 464-7926.

Sincerely,


Cary Binger
Planning Director

cc: Ed Wyatt
George Lasko



DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Centers for Disease Control
Atlanta GA 30333
July 1, 1988

Calvin M. Yanagihara
Colonel, Corps of Engineers
Dept. of the Army
San Francisco District,
Corps of Engineers
211 Main Street
San Francisco, California 94105-1905

Dear Mr. Yanagihara:

Thank you for sending the Draft Environmental Impact Statement (DEIS) for "The Proposed Expansion of the Ox Mountain Sanitary Landfill." We have reviewed the document for possible health effects and believe that the document adequately addresses these issues. We particularly appreciate the addition of a section entitled "Public Health and Safety" specifically addressing health issues including: Regulation, Landfill Cases, Dust Generation, Vectors, Fires, Truck Traffic, and Site Security.

Thank you for sending this document for our review. Please insure that we are included on your mailing list for further documents which are developed under the National Environmental Policy Act (NEPA).

Sincerely yours,

David E. Clapp

David E. Clapp, Ph.D., P.E.
Environmental Health Scientist
Special Programs Group
Center for Environmental Health
and Injury Control

MEREDITH/BOLI & ASSOCIATES, INC.

— SCIENTIFIC and REGULATORY CONSULTANTS —

6701 Center Drive West, Suite 900
Los Angeles, California 90045-1535
(213) 670-9221

28 June 1988

Colonel Galen H. Yanagihara
District Engineer
US ARMY CORPS OF ENGINEERS
211 Main Street
San Francisco, California 94105-1905

Re: Comments on Draft Environmental Impact Statement -- Ox Mountain
Sanitary Landfill, Apalollo Canyon Expansion Site, San Mateo County,
California (Regulatory Permit Application No. 166115S91)

Dear Colonel Yanagihara:

Meredith/Boli & Associates, Inc. (M/B&A), on behalf of its client Waste Management, Inc. (WMI), has reviewed the referenced draft EIS, which is dated May 1988. Enclosed please find comments on the adequacy and content of the document.

The US Army Corps of Engineers (USACE) required the preparation of an EIS because Browning Ferris Industries' (BFI's) Section 404 permit application to construct a 285-acre sanitary landfill in Apalollo Canyon is predicated on the filling of 3.43 acres of wetlands. It is our understanding that to expedite the preparation of the EIS, BFI contracted directly with Harding Lawson Associates. USACE Regulation ER-200-2.2 stipulates that the Corps was required to advise BFI in regard to the types of information to include in the draft statement, as well as to the adequacy of the information gathered during its preparation.

The draft EIS essentially is a rehash of the February 1986 Final Environmental Impact Report (EIR), which was prepared by Thomas Reid Associates for San Mateo County. The EIR has been updated and augmented with limited additional information (see page 2-1 of the draft EIS). Regulation ER 200-2.2, paragraph 10f, states that in the case of an applicant-prepared EIS "the district engineer shall ensure the conduct of an independent evaluation of the information submitted and shall be responsible for its accuracy." M/B&A's independent analysis evinces that the USACE San Francisco District did not fulfill its obligation to assist BFI in the preparation of an impartial, technically accurate, and complete draft EIS.

It is WMI's and M/B&A's opinion that the statement was written to promote the selection of, and the eventual issuance of a permit for, BFI's and San Mateo County's "preferred alternative" (i.e., the Apalollo Canyon 1,200-foot alternative). The draft EIS, therefore, attempts to justify a prior decision in conflict with 40 CFR 1502.2(g). This error is particularly flagrant because the USACE has not identified its "preferred alternative or alternatives" as mandated by 40 CFR 1502.14(e). At the crux of the USACE's decision-making

process are the immutable facts that the applicant's proposed action will result in the irreversible destruction of 3.43 acres of wetlands and the elimination of 5,600 linear feet of productive stream and associated riparian habitat. Other alternatives (i.e., sites and solutions) doubtlessly could avoid or reduce these negative environmental impacts.

5-3

Nearly every section of the draft EIS lacks technical, scientific, and/or procedural rigor. The statement is incomplete, contains serious inadequacies, and omits crucial scientific and technical data in the following areas:

- Alternatives
- Mitigation Plan
- Endangered Species
- Water Quality and Quantity
- Landfill Design
- Faulting and Seismicity
- Traffic, Noise, and Population
- Air Quality.

5-4

In summary, the draft EIS does not provide the information, data, and supporting environmental impact analyses on which to base a decision to issue a Section 404 permit to eliminate valuable wetlands and a fishery through the placement of fill, let alone to site a solid waste landfill. Pursuant to 40 CFR 1502.9(a), the extent and severity of the deficiencies outlined in the attached comment document dictate that the USACE require the applicant to revamp the draft EIS prior to preparing a final EIS. The revised draft EIS should be circulated for public review and comment per 40 CFR 1502.9(c)(4). Should the district engineer ignore the overwhelming negative evidence and elect to proceed directly with the preparation of a final EIS, we request that all of the comments and questions appended hereto be answered therein.

Thank you for the opportunity to comment on the draft document. If we can be of assistance during the revision of the draft EIS, please contact either of the undersigned.

Sincerely,

Thomas J. Dolan

Thomas J. Dolan
Project Manager

E. Clark Boli

E. Clark Boli
Principal

TJD/ECB:lls

Enclosure

cc: Mr. Peter Vardy
Mr. Gino Scopesi
Mr. Martin Sore
Mr. Norm Matleoni
Mr. Tom Blackman
MB-1982-2(56) File

MEREDITH/BOLI & ASSOCIATES, INC.

28 June 1988

COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT

OX MOUNTAIN SANITARY LANDFILL
 APANOLIO CANYON EXPANSION SITE
 SAN MATEO COUNTY, CALIFORNIA
 (US ARMY CORPS OF ENGINEERS REGULATORY PERMIT NO. 16611S91)

prepared by

MEREDITH/BOLI & ASSOCIATES, INC.
 6701 Center Drive West, Suite 900
 Los Angeles, CA 90045-1535

submitted on behalf of

WASTE MANAGEMENT, INC.

This document presents technical review comments concerning the draft Environmental Impact Statement (EIS) entitled "Ox Mountain Sanitary Landfill, Apanolio Canyon Expansion Site, San Mateo County, California." The draft EIS was released by the US Army Corps of Engineers (USACE), San Francisco District, on 27 May 1988.

Throughout this comment document, reference is made to the following Federal guidelines that govern the preparation of EISs:

- Code of Federal Regulations (CFR), Title 40, Parts 1502 and 1503, Council on Environmental Quality, "Environmental Impact Statement" and "Commenting"
- US Army Corps of Engineers (USACE) Regulation ER-200-2-2, "Environmental Operating Procedures and Documents for Regulatory Functions."

The remainder of this comment document is organized by the following subject headings:

- Overview of Environmental Impacts
- Alternatives Analysis
- Mitigation Plan
- Endangered Species
- Water Quality and Quantity Impacts
- Landfill Design
- Faulting and Seismicity

1

MEREDITH/BOLI & ASSOCIATES, INC.

- Traffic, Noise, and Population
- Air Quality
- EIS Format/Administrative Content
- References.

OVERVIEW OF ENVIRONMENTAL IMPACTS

The environmental impacts of the Apanolio Canyon 1,200-foot alternative are significant and, assuming the implementation of the proposed landfill design and Mitigation Plan, irreversible. Browning Ferris Industries (BFI) proposes to develop and/or to fill 285 acres in the upper portion of the Apanolio Canyon, a part of the Pilarcitos Creek watershed. The proposed project would fill the canyon from about a 500 foot msl elevation to a 1,200 foot msl elevation, with an average refuse/cover depth of 185 feet. The direct impacts of landfill construction are numerous. The proposed project would result in the loss of valuable vegetation and wildlife habitat, including:

<u>Vegetation Type</u>	<u>Loss (acres)</u>
Wetlands	3.43
Riparian Woodland	4.6
Douglas Fir Forest	43
Grassland	2
Coastal Scrub Chaparral	232
TOTAL	285.03

The wildlife that utilize these interrelated areas of vegetation similarly would be eliminated or displaced to other environments.

In addition to the loss of vegetation, the proposed project would eliminate approximately 5,600 linear feet of existing stream channel. Approximately 3,676 feet of this stream channel presently function as perennial cold water stream habitat for invertebrates and a resident, stream-locked, steelhead trout population.

The draft EIS states (page 5-25): "The loss of vegetation in Apanolio Canyon would be important in a local context because the site currently has high biological diversity and wildlife value due to its remoteness and relative lack of disturbance. In a regional context, the most significant loss would be the riparian and aquatic habitats, because they represent diminishing resources of high value in the Bay area and throughout California." The preferred alternative would result in the complete destruction of an integrated, relatively pristine wetland/forest ecosystem. The proposed piecemeal "mitigation" will not replace or duplicate the ecological functions and the species diversity now evident in Apanolio Canyon.

5-5

5-6

The draft EIS states that the proposed project likely would not impact the San Francisco garter snake, an endangered species, or potential candidate species

2

MEREDITH/BOLI & ASSOCIATES, INC.

for endangered species status. The conclusion regarding the San Francisco garter snake is based on approximately 9 months of trapping at the site. However, Apanolio Canyon lies within the garter snake's known range, and the lack of trapping success does not preclude its existence in the canyon. Moreover, the garter snake has been collected from a lagoon near the mouth of Pilarcitos Creek (by telephone, US Fish and Wildlife Service, 9 June 1988). At the very least, landfill construction would eliminate any potential use of the canyon's diverse habitat by the snake.

Additional impacts associated with landfill construction and operation include water quality degradation, both of surface water and groundwater, and permanent alteration of downstream water flows. Water originating from the Apanolio Canyon watershed presently is used as an agricultural water supply and, to a limited extent, for domestic water supply. Apanolio Creek contributes approximately 8% of the flow in Pilarcitos Creek. Any modification to the creek may significantly alter the habitat value of the downstream channel, especially during summer low-flow periods. Landfill construction and operation also would aggravate traffic congestion on Highway 92, and would diminish air quality in the immediate vicinity of the landfill.

5-7
5-8

ALTERNATIVES ANALYSIS

Page 1-1 of the draft EIS states that "... County planning studies and documents identified the Ox Mountain Ranch as the County's primary long-range landfill location." The document subsequently provides technical and socioeconomic information intended to justify San Mateo County's decision to support BFI's proposed Apanolio Canyon 1,200-foot landfill expansion, the "preferred" alternative. The site evaluation analysis (Section 3.8) resulted in the selection of four alternative sites and a no action alternative. The four alternative sites are located in the immediate vicinity of the existing Corinda Los Trancos Canyon landfill. In addition, all of the proposed alternative sites, with the exception of Nuff Canyon, are owned by the applicant. Only limited data are provided regarding the four non-preferred alternatives. In part, because the environmental impacts of the development of the first two would be almost indistinguishable from the preferred alternative:

- Apanolio Canyon 850-foot (a reduced project)
- Corinda Los Trancos Canyon - Forefill
- Nuff Canyon
- No Action.

Per 40 CFR Section 1502.2(g), EISs "...shall serve as the means of assessing the environmental impact of proposed agency decisions, rather than justifying decisions already made." Therefore, the draft EIS is deficient because it does not consider objectively a spectrum of alternatives, but serves to justify the preferred alternative. Most significantly, it is not clear that the USACE ever identified its "preferred alternative or alternatives" as required by Section 1502.14(e).

5-10

Site Evaluation

5-11

Three potential sites identified in a 1987 San Mateo County Department of Public Works study are eliminated for non-specific reasons in Section 3.4 of the draft EIS:

- Frenchman's Creek Canyon
- Locks Canyon
- Arroyo Leon Canyon.

A revised draft EIS should present an objective technical and economic analysis of these sites and justify their elimination from further consideration. The draft EIS suggests that these sites were rejected primarily for aesthetic and/or ownership reasons. The applicant cites access problems as another reason. However, no discussion of the cost of building an access road is provided. For example, one road could serve both Frenchman's Creek Canyon and Locks Canyon; their combined use would provide an 88-year project life, as well as reduce by half the wetland acreage affected. On the other hand, the Arroyo Leon Canyon site was the recommended site in the 1963 siting study conducted for San Mateo County, yet it was dismissed summarily in the draft EIS. All three of these sites warrant more thorough consideration.

Nuff Canyon

5-12

Insufficient information is provided in the draft EIS to eliminate Nuff Canyon as a viable alternative. The draft EIS purports that the private ownership of Nuff Canyon and its designation as a State significant mineral resource are sufficient reasons to exclude its use as a landfill. Only limited scientific and technical data are provided regarding the environmental impacts associated with a Nuff Canyon alternative. Extensive field studies were not conducted to determine the extent of potential wetlands subject to Corps jurisdiction (see page 5-33). Because wetland impacts are a critical environmental issue in the USACE's decision-making, the absence of this information is a critical flaw in the draft EIS.

Based on the limited information provided, the Nuff Canyon alternative appears to offer several advantages compared to the Apanolio Canyon 1,200-foot alternative:

- An already partially-disturbed site owing to mining operations
- Reduced filling of wetlands (approximately 2 acres, which are not confirmed to be subject to the USACE's jurisdiction, versus the 3.4 acres of high quality wetlands in Apanolio Canyon)
- Reduced filling of stream channel (4,200 feet versus 5,600 feet for Apanolio Canyon)
- No impacts to a known resident fishery
- Multiple use of open space (i.e., joint mining and landfill operations)
- No need to import landfill cover.

The potential for significantly reduced impacts with the Nuff Canyon alternative warrant an expanded analysis in a revamped draft EIS. The analysis should include:

- Detailed vegetation, habitat, and endangered species survey and impact analysis
- Detailed analysis of hydrologic impacts
- Plans for a joint mining/landfill operation that maximize site landfill capacity and mineral resource extraction
- Formal statements of site availability or non-availability
- Detailed economic analysis.

Out-of-County Alternatives

The out-of-county, or out-of-jurisdiction, disposal alternative is not considered seriously, and is lumped inappropriately into the "No Action" alternative (page 3-63). 40 CFR 1502.14 indicates that all reasonable alternatives facing the ultimate decision-maker must be considered. The only justifications provided for not considering out-of-county disposal are increased cost (Table 3.4-3) and political/legal issues (Appendix C). The draft EIS preparers admit that they did not complete the interactions necessary to determine if out-of-county alternatives were feasible (see page 3-10, footnote 1). Moreover, the relationship between the costs associated with these alternatives and the loss of high quality wetlands, endangered species habitat, and a trout fishery, as well as other irreversible environmental impacts discussed elsewhere in this comment document, is not discussed in the draft EIS as mandated by 40 CFR 1502.23. The revised draft EIS should address the out-of-county alternative in as much detail as the other alternatives, including the associated environmental impacts that may be avoided and/or created.

Conservation and Recycling

Under the "No Action" scenario, BFI predicts that with the recycling programs currently in place, annual landfill capacity requirements could be reduced by 29,000 tons. BFI does not discuss how this affects the suitability and possible use of smaller landfills that were eliminated during the first round of its evaluation because of size constraints. A discussion of conservation potential and its effects on project alternatives and lifetimes is required by 40 CFR 1502.16(e).

Economic Analysis

The summary economic analyses in Sections 3.4 and 5.12 are not presented in sufficient detail to judge the cost-effectiveness of the various alternatives. An expanded economic analysis should be featured in the revised draft EIS. At the minimum, it should address the following topics.

- The cost comparison for existing landfills outside San Mateo County (Table 3.4-3) should be based on estimated costs of the proposed Apanolio Canyon expansion not on the existing Ox Mountain Corinda Los Trancos Landfill. For example, the tipping fee may be raised significantly for the proposed landfill.

- The value of the potentially lost Nuff Canyon quarry resource (see page 5-90) is not substantiated; a source or basis should be cited. The analysis assumes that landfill operation will preclude mining operations; however, a joint mining/landfill operation might be feasible, but is not even discussed.
- The construction costs for the Nuff Canyon alternative shown on Table 5.12-1 appear high relative to the Apanolio Canyon 1,200-foot alternative considering the reduced acreage of the Nuff Canyon project (117 acres versus 285 acres for Apanolio Canyon). Unit costs for each landfill alternative should be included in the revised draft EIS.
- The Nuff Canyon alternative likely would require significantly lower contingency reserves than the Apanolio Canyon 1,200-foot alternative for potential remedial actions following floods and earthquakes.
- Potential costs to nearby landowners due to landfill construction and operation should be calculated and incorporated into the comparison of alternatives. Public comments already contained in the draft EIS describe increased land erosion and loss of acreage during the operation of the Corinda Los Trancos Canyon Landfill due to alteration of streamflow patterns; yet these impacts are not considered in the cost analyses.
- No justification is given for comparing costs of the preferred Apanolio Canyon 1,200-foot alternative, which has an estimated life-time of 93 years, to alternatives with lesser estimated life-times. Moreover, it is not presented clearly in the draft EIS how the life-times of the non-preferred alternatives were derived. A phased Nuff Canyon alternative, that would not preempt resource extraction, has not been explored yet, but might result in a significantly larger landfill capacity than projected by BFI.

Land Use

A variety of land use issues must be addressed pursuant to 40 CFR 1502-- "areas of controversy, including issues raised by ... the public." In addition, Section 1502.16(c) requires discussion of possible land use conflicts. Public comments contained in the draft EIS contend that a land use conflict will occur between the landfill operation and agricultural/residential activities. The conflict will arise from the reduction and degradation of both surface water and groundwater that is used for human purposes. These concerns must be addressed in the revised draft EIS.

Additionally, Section 1502.16 requires discussion of short-term uses versus long-term productivity, as well as indirect effects on socioeconomic and land use patterns. A discussion of short-term versus long-term landfiling options is contained in the draft EIS; this myopic definition of "land use" precludes a meaningful evaluation of impacts. A discussion should be included of how the relatively short-term use of the canyon as a landfill will affect long-term agricultural activities and productivity. Under this heading, the subject of pest control should be addressed. For example, the draft EIS documents that one farmer already has installed pest barriers and has discontinued pumpkin farming due to the increased rat population caused by the Corinda Los Trancos Canyon Landfill.

MITIGATION PLAN

5-18

The proposed Mitigation Plan (Appendix B to the draft EIS), which was prepared by Ralph Osterling Consultants, is inadequate and inappropriate for the proposed Apanollo Canyon 1,200-foot alternative. The proposed landfill would destroy 285 acres of an integrated, relatively pristine, forest/wetland ecosystem. The proposed Mitigation Plan treats the replacement of this resource in an arbitrary and piecemeal fashion. The total plan does not, contrary to statements in the draft EIS, mitigate the losses that would accrue from implementation of the 1,200-foot alternative.

Habitat Value Comparison Methodology

5-19

Appendix B of the Mitigation Plan describes the "habitat value comparison methodology" used to compare the "habitat value units" [sic] of the biological resources, which would be destroyed by the 1,200-foot alternative, to the habitat values of the proposed mitigation projects. The origin of this habitat value methodology is not referenced, but it is presented as a quantitative procedure that purports to compare objectively the lost and replacement resources. Examination of the methodology indicates that it is extremely arbitrary in its ranking of resource values. At best, it could be termed a qualitative procedure that grossly examines the value of a resource or habitat.

The methodology arbitrarily selects habitat evaluation factors and assigns a habitat value ranking that ranges from 1 to 10 for each factor. Little justification or rationale is provided for the selection of the evaluation factors and rankings. The analysis assumes that all of the evaluation factors are equal in importance (e.g., the value of song birds is equal to that of amphibians). The selection was at the sole discretion of the applicant, and leads to the habitat value of lost wetlands (Table B-10) being roughly equal to created wetlands (Table B-12). The value of an integrated, diverse, relatively pristine wetland cannot be judged using such a biased, arbitrary methodology.

At the minimum, the habitat value methodology should be revised to include:

- Justification for methodology (i.e., previous use in EISs, EIRs, etc.)
- Detailed rationale and explanation for all evaluation factors and rankings, including references to technical literature for each selection
- Justification for equating value of existing wetlands with proposed created wetlands, including discussion of ecological values based on the scientific literature (not just an arbitrary assignment).

5-20

The USACE is mandated to "...insure the professional integrity, including scientific integrity, of the discussions and analyses in environmental impact statements" (40 CFR 1502.24). To fulfill this obligation, which obviously has not been met, the entire Mitigation Plan should be evaluated by a certified ecologist/wildlife biologist. Thereafter, significant revisions can be incorporated into the revised draft EIS.

Wetland Restoration

5-21

The preferred alternative would eliminate 3.43 acres of nearly contiguous wetlands in Apanollo Canyon. To compensate for this loss, the Mitigation Plan proposes five separate mitigation projects: 1) Pilarcitos Creek streambank restoration (.73 acre), 2) Apanollo sediment pond planting (1 acre), 3) upland spring development (.25 acre), 4) new ponds below Corinda Los Trancos Canyon Landfill (2.5 acres), and 5) planting of the upper pond at Corinda Los Trancos Canyon Landfill (.10 acre). This piecemeal approach to wetland restoration does not compensate for the destruction of 3.43 acres of contiguous natural wetlands. Isolation of wetlands lowers species diversity, resulting in lowered plant viability and incomplete habitat restoration. The proposed mitigation projects would be located in continually disturbed areas (e.g., at the Apanollo Canyon landfill sediment basin). The productivity and ecological value of these disparate projects likely would be less than the existing wetlands.

The revised draft EIS should include a wetland mitigation project that fully compensates for the devastation of 3.43 acres of natural wetlands. At the very minimum, the proposal should feature one site equivalent to 3.43 acres, located in a relatively undisturbed area, and designed to provide equivalent ecological functions to that of the wetlands to be destroyed. The applicant should be required to address a larger mitigation project that would include wetlands, riparian vegetation, and forest to compensate for the warped ecological functions. Also, the revised draft EIS should discuss the relative value of wetlands associated with pond environments, versus those associated with a perennial stream; the proposed Mitigation Plan assumes incorrectly that these wetland types are equivalent.

Mitigation for Stream Channel Loss

5-22

The Mitigation Plan does not provide for the replacement of the 5,600 feet of Apanollo Creek that would be eliminated by the Apanollo Canyon 1,200-foot alternative. Of this 5,600 feet, approximately 3,676 feet represent freshwater habitat for a resident steelhead trout fishery. The proposed mitigation consists of creek habitat "improvements," including modification or construction of fish passages and streambank restoration. Enhancement of downstream channel or out-of-waterhed stream channels does not compensate for the annihilation of 5,600 feet of stream channel and associated habitat. The revised draft EIS should include a revised stream channel mitigation plan that incorporates the replacement of the stream channel, or at a minimum, provides for restoration of an existing severely degraded stream channel.

Non-Mitigation Projects

5-23

The Mitigation Plan proposes several projects as mitigation for lost environmental resources which are, in fact, simply operation and maintenance requirements, or marginal attempts to provide mitigation. The following proposed mitigation measures should be stricken from the draft EIS, and the habitat value analysis adjusted accordingly:

- Prescribed burn program (page 18)
- Grassland development on landfill face (page 20)

- Water temperature modification for a 1,500 foot long concrete channel (page 21)
- Maintenance of sediment control structures (page 24).

If these mitigation measures are retained in the revised draft or final EIS, the applicant should demonstrate that these measures previously have been considered as mitigation by regulatory agencies for other projects.

Implementation and Maintenance of Mitigation Plan

The Mitigation Plan is extremely vague in regard to the responsibility of BFI for the implementation and maintenance of the proposed mitigation projects. No definite schedule is provided for implementation of each mitigation project. The revised draft EIS should include an implementation time-table.

Page 27 of the Mitigation Plan states that BFI intends to monitor each mitigation project for 5 years to "confirm the requirements of no net loss of acres or habitat has been achieved." Further, the Mitigation Plan states: "As each mitigation project is completed and the monitoring verifies the full effectiveness, BFI will be relieved [emphasis added] of further responsibility on that project." The Apanolio Canyon 1,200-foot alternative has an estimated life-time of 93 years plus an unspecified post-closure care period. BFI's estimated cost for the proposed mitigation (i.e., \$350,000) is less than 0.3% of total project cost. Because the losses of natural vegetation and wildlife habitat in Apanolio Canyon are permanent, and because the mitigation expenditure is so incredibly low, BFI should be required to maintain the proposed projects for a minimum of 200 years, or more.

The responsiveness of BFI and/or of involved governmental agencies to provide mitigation should be reviewed prior to approving any mitigation plan. In 1982 BFI furnished \$125,000 to the State of California to serve as a mitigation fund for the filling of 33.5 acres of wetlands at its Newby Island Landfill in San Jose. To date, a mitigation project for the lost wetlands has not been commenced.

ENDANGERED SPECIES

Section 4.3.4 (page 4-56) of the draft EIS contains an inadequate analysis of the potential environmental impacts of the proposed Apanolio Canyon 1,200-foot alternative on endangered species.

San Francisco Garter Snake

The draft EIS (Section 4.3.4(c)) presents an incorrect assessment of the potential for adverse impacts to the San Francisco garter snake, a Federal endangered species. The draft EIS concluded (page 5-29): "... that no impact to any State- or Federally-listed threatened or endangered species would be likely to occur at the site as a result of project development and operation." This conclusion was based on two preliminary findings: 1) the Apanolio Canyon site does not contain habitat suitable for the San Francisco garter snake and 2) a trapping program conducted from May 1987 through December 1987 did not result in the capture of a specimen. The conclusion was premature because the trapping program was to continue through May 1988. The results of the

complete trapping program must be included in the revised draft EIS. Also, the destruction of 8 acres of wetland/riparian vegetation and 5,600 feet of stream channel eliminates any potential use of this site by the garter snake.

Although, to date, no San Francisco garter snakes have been observed on the proposed Apanolio Canyon site, the draft EIS states that potentially suitable pond-type habitat may exist downstream from the site. The draft EIS does not divulge the occurrence of the garter snake anywhere in the Pilarcitos Creek watershed; however, the U.S. Fish and Wildlife Service reported (by telephone, 9 June 1988) that the endangered garter snake has been located in a lagoon near the mouth of the Pilarcitos Creek. The revised draft EIS must present the results from expanded on-site and downstream trapping programs, as well as a detailed analysis of the potential impacts to the San Francisco garter snake downstream from the Apanolio Canyon site. Any inadequacies in the landfill leachate and collection system could pollute Pilarcitos Creek sufficiently to impact severely the San Francisco garter snake. A mitigation and contingency plan should also be developed to protect the garter snake population.

Marbled Murrelet

The proposed site contains stands of mature Douglas fir. The draft EIS indicates that this type of habitat could be utilized by the marbled murrelet, a pelagic seabird that is designated a species of State special concern. Based on a 1-day field survey, the draft EIS (page 4-57) concludes: "...Apanolio Canyon does not contain suitable nesting habitat for marbled murrelets." This presumption is based on incomplete/insufficient evidence; 40 CFR 1502.22 mandates that the USACE correct this deficiency. The revised draft EIS should include the results of a more comprehensive field survey.

WATER QUALITY AND QUANTITY IMPACTS

The San Francisco Bay Regional Water Quality Control Board has determined (Tentative Order dated 16 May 1988) that the existing beneficial uses of the groundwater beneath the proposed Apanolio Canyon landfill area are:

- Groundwater recharge (lower Apanolio Canyon Aquifer)
- Freshwater replenishment (Apanolio Creek).

The potential beneficial uses of the groundwater beneath the landfill area were identified as:

- Domestic water supply
- Agricultural water supply.

The existing and/or potential beneficial uses of the surface water in Apanolio Canyon, which includes the entire length of Apanolio Creek, the unnamed tributaries in the landfill area and the lower canyon, and contiguous waters, were identified as follows:

- Cold fresh water habitat
- Warm fresh water habitat

- Wildlife habitat
- Fish migration and spawning
- Water contact recreation
- Non-contact water recreation
- Municipal and domestic water supply
- Agricultural water supply
- Groundwater recharge.

5-29

The construction and operation of the Apanollo Canyon 1,200-foot alternative would impact severely these beneficial uses. The draft EIS does not adequately address the potential impacts to the quality and quantity of water of the Apanollo Canyon watershed, or associated impacts in the Pilarcitos Creek watershed.

Streamflow Alteration

5-30

The draft EIS (Section 5.2) states that construction of the Apanollo Canyon landfill would increase annual Apanollo Creek streamflow by 19% at the BFI property line. However, summer streamflows would be decreased by 40% as the landfill reached capacity. The draft EIS does not discuss the environmental ramifications of these changes in streamflow. Increased annual flow likely would result in decreased recharge to the lower canyon aquifer, thereby reducing the volume of available groundwater. The decreased summer streamflow could disrupt the downstream beneficial uses. A 40% reduction during the summer low flow period could jeopardize the use of the creek by fish, reduce wildlife habitat, and curtail water supply. The revised draft EIS must address these impacts in detail, provide adequate mitigation for lost beneficial uses, and contain a contingency plan to address streamflow alterations that would be larger than anticipated in the draft EIS.

5-31

Alteration of streamflow implies that existing water rights downstream from the Apanollo Canyon landfill would be impacted. The draft EIS does not cover this issue. The revised draft EIS should address mitigation or compensation to property owners whose water rights (both groundwater and surface water) would be affected by the project.

Hydrogeology

5-32

The geological cross sections discussed in Section 4.1(b) are not described adequately (see page 4-7, paragraph 3). Were the cross sections generated from actual borings? If so, the locations of the borings should be depicted in Figure 4.1-3 along the cross section. Section 101 of Figure 4.1-4 (page 4-9) shows weathered and unweathered bedrock, as well as the recent alluvium/colluvium, with dashed lines. If these cross sections were generated from borings, why are they shown as dashed lines? The revised draft EIS should present specific locations for borings on the slopes of the canyon, as well as elevations of weathered and unweathered bedrock and groundwater levels.

5-33

The draft EIS (Section 4.2(b)) does not establish groundwater levels or potentiometric surfaces in the ridges surrounding Apanollo Canyon. Without this information, the impacts of the facility on downgradient groundwater users cannot be established adequately. The draft EIS states that the unweathered bedrock is highly fractured; therefore, it is important to determine the direction of groundwater movement to assess the direction of potential leachate migration. Without these data, it is not possible to assess the environmental impacts of leachate movement. In addition, the revised draft EIS should address the rate, direction of groundwater flow, and potential leachate movement in each of the geologic units present on the site, down-canyon, and in adjacent canyons. The revised draft EIS should consider both primary porosity and flow through fractures to define directions of groundwater and potential leachate flows to downgradient potable groundwater users. The statement presented in the draft EIS regarding directional components of bedrock fractures is not substantiated. The supporting data are important for an overall assessment of groundwater movement and for projections of the rate of leachate movement.

5-34

Section 4.2(b) also makes unsubstantiated assertions as to limited hydraulic connections. The revised draft EIS should address the potential for leachate moving to the bedrock and flowing to adjacent canyon stream systems. This type of leachate flow could contaminate downgradient aquifers. The draft EIS (page 4-31) suggests that preliminary results from pump tests conducted by Purcell, Rhoades and Associates in lower Apanollo Canyon during February/March 1988 indicate Apanollo Creek demonstrates hydraulic isolation from the lower canyon aquifer. The revised draft EIS should substantiate this conclusion, particularly as it is stated in the draft EIS that surface water and groundwater are linked in surrounding canyons, and the water table is quite high -- within 3 feet of the surface in parts of the canyon. The revised draft EIS must define the hydrogeologic environment accurately before the impacts of the proposed project can be postulated and compared.

5-35

The revised draft EIS also should include the following hydrogeological data in Section 4.2(b):

- Potentiometric map -- Environmental impacts cannot be assessed without determining the direction and rate of groundwater movement (and potential leachate movement due to landfill operation)
- Complete listing of boring locations and logs -- Do the groundwater elevation and monitoring well locations shown on Figure 4.2-2 represent all the borings that were drilled within the site area?

Water Quality

5-36

The draft EIS does not describe adequately present water quality in the Pilarcitos Creek watershed and the potential impacts to water quality that would result from the construction and operation of the Apanollo Canyon 1,200-foot alternative. The draft EIS states (page 1-8) that the landfill design will protect surface and groundwater quality in the project area. However, the draft EIS provides little justification for this statement (see Landfill Design and Faulting and Seismicity sections herein), and does not obviate the need to analyze potential water quality impacts due to leachate release or increased

5-37

sediment loadings. No leachate collection and recovery system or sediment basin is 100% effective.

The draft EIS presents water quality data regarding BFI's adjacent Corinda Los Trancos Canyon landfill. They indicate that landfill operation has resulted in the deterioration of groundwater quality near the toe of the landfill. The San Francisco Bay Regional Water Quality Control Board (by letter to BFI, dated 26 November 1986) reported that leachate from the Corinda Los Trancos Canyon landfill may be migrating offsite, because leachate is present in monitoring wells. The leachate presumably is moving downgradient through the alluvial rock, and potentially is moving through the fractured bedrock. The chemical characteristics of the leachate exceed water quality standards for municipal water supply, as well as for agricultural use, and may be affecting the water quality of an adjacent private well.

5-38

The review of water quality data (Section 4.2) for the three alternative sites (i.e. Apanolio Canyon, Huff Canyon, and Corinda Los Trancos Canyon watersheds) is incomplete. Analytical data for both surface water and groundwater should include a full RCRA Appendix IX spectrum of parameters. At the minimum, a full EPA Method 824 volatile organic scan should be provided for determination of baseline conditions. The revised draft EIS should address whether leachate generated at the proposed sites will contain volatile organic compounds at concentrations in excess of State water quality standards. Background ambient conditions for both groundwater and surface water must be well defined before construction of any facility.

5-39

It cannot be assumed that any landfill design will protect totally surface and groundwater quality in the Pilarcitos Creek watershed. Simply stating, as the draft EIS does (page 1-8), that landfill design will protect water quality is no guarantee that the landfill will operate as advertised. The revised draft EIS should provide the following information regarding the potential for water quality impacts:

- Analysis of the probability of landfill failure, leachate loss, and excess sediment loss
- Estimates of the annual volumes of leachate and sediment loss
- Analysis of the combined water quality impacts of both the Apanolio Canyon landfill and the Corinda Los Trancos Canyon landfill on the groundwater and surface water within the Pilarcitos Creek watershed. This analysis should include water quality impacts due to leachate loss and increased sediment loadings from runoff.

LANDFILL DESIGN

5-40

The draft EIS purports (page 1-8) that the design of the Apanolio Canyon 1,200-foot alternative will be sufficient to protect water quality in the Pilarcitos Creek watershed. However, M/B&A's review of the limited design details provided in the draft EIS indicates severe deficiencies. They render suspect any claim that the design will contain leachate and thus protect water quality in the basin.

The draft EIS (page 3-28) discusses the concept of an under-drain design conforming to the Apanolio Canyon geologic conditions. The system, as described, should include the calculated efficiency of the under-drain system. Because the under-drains, as shown on Figure 3.5-6, are plus or minus 1,000 feet apart, a number of technical points are raised that should be addressed in the revised draft EIS:

- What will the yield of groundwater from the bedrock during both high and low water table conditions be? Is the drain system adequate to handle this flow? What is the calculated groundwater flow to the under-drain system?
- What bedrock and alluvial areas between the lateral drains will produce water? Without this information, the draft EIS does not and cannot address actual environmental impacts.
- What impacts will occur due to the reduction in groundwater discharges to the canyon? Once the canyon is filled, how will this reduce surface water discharges to downgradient, or lower, fish spawning areas and affect domestic and agricultural water supplies?

Given the approximate 1,000 foot separation between the drains (pages 3-32 to 3-35, Figure 3.5-6), the draft EIS should provide the calculated groundwater elevations at mid-points between the drains as part of the environmental assessment. Without such data, the efficiency of the groundwater collection system cannot be assessed and environmental impacts cannot be evaluated. In addition, a scale should be provided for the drainage system drawing (see Figure 3.5-8).

5-41

The landfill design, as presented, fails to meet a key prescriptive standard stipulated for sanitary landfill design in the California Code of Regulations (CCR), Title 23, Chapter 3, Subchapter 15, Section 2530(c) requires new landfills to be sited, designed, constructed, and operated to ensure that all wastes are a minimum of 5 feet above the highest anticipated elevation of the underlying groundwater. The draft EIS alleges an engineered alternative to this proposed design. The revised draft EIS should address this issue, and present sufficient groundwater data and analyses to substantiate any claim regarding the maintenance of a 5-foot separation between groundwater and refuse.

5-42

Section 3.5(a) is deficient in its description of the proposed leachate collection and removal system. The draft EIS states (page 3-33): "Leachate generated from the landfill would be collected from the surface of the landfill liner and diverted to a holding tank for proper treatment or disposal" [emphasis added]. The draft EIS does not specify what is meant by "proper treatment and disposal." The draft EIS provides no additional information regarding leachate disposition, other than it may be sprayed on the landfill for dust control. The revised draft EIS should provide a detailed description of proposed leachate storage, treatment, and disposal techniques. The revised draft EIS also needs to address disposal options (and costs) for leachate if it is characterized as a hazardous material according to CCR, Title 22, Chapter 30, Article 11. The potential volumes of leachate and liner infiltration should be established using the EPA HELP model (Schroeder et al. 1984) and the Wong model (1977). These analyses are necessary to determine the percentage of leachate that would be collected and the percentage of leachate that would be discharged to the surface water and groundwater.

5-43

The draft EIS (page 3-35) discusses the design of the under-drain system, but does not address the potential for the weathered bedrock and the fresh bedrock to compact and cause leakage of the under-drain and storm drain system. The revised draft EIS should present laboratory test results for consolidation of the alluvium, as well as for the weathered and unweathered bedrock. The under-drain design system has the potential to be troublesome; cracking of the reinforced concrete will mix the collected leachate, storm runoff, and groundwater drainage from the bedrock adjacent to the landfill. The cracking of the under-drain system, if not repaired, would cause major impacts to downgradient surface waters and groundwater adjacent to the site.

5-44

The design of the clay liner and leachate collection blanket, as shown in Figure 3-4-7 (page 3-36), does not appear to be appropriate given the high angles of the natural slopes. It would be very difficult, if not impossible, to install a 12-inch clay liner on a 2:1, or even up to a 1:1, slope in the canyon area. The revised draft EIS should substantiate any claims as to the constructibility of this liner and EIS should describe system, and anticipated construction and quality control problems.

5-45

Page 3-39 of the draft EIS describes a filter rock blanket extending only several hundred feet on either side of the main under-drain encasement. Does the main under-drain encasement include all of the under-drain system as provided for in Figure 3-5-6 (page 3-34), or does it only include drain lines in the center of the canyon? Limiting the filter rock blanket to areas around the main under-drain encasements would leave more than 50% of the landfill without an under-drain system. This may constitute a major design error, given the high permeability of the foundation rock and the ill-defined groundwater levels in the bedrock. The draft EIS states (page 3-32) that groundwater contacting the liner potentially could damage the clay liner. The revised draft EIS must present detailed water table maps showing where the liner will be affected and assess the potential operational and environmental impacts.

5-46

The revised draft EIS should address how the landfill will handle a rising water table in those areas not controlled by "hydraugers" as discussed on page 3-41. The effect of such a water table rise on leachate production and movement also should be addressed.

5-47

Section 3.5(a) of the draft EIS does not address specifically the extent of the liner system. The draft EIS suggests that the liner would extend only to those areas of the canyon that can be constructed easily. The revised draft EIS should present design details regarding the construction of the clay liner and the use of a high density polyethylene (HDPE) blanket in those areas too steep for typical construction practices.

5-48

The draft EIS (page 3-41) discusses a 5-foot subgrade "barrier." What will be the in-place permeability of this compacted fill? Will this subgrade barrier be constructed from on-site material? What will be the quality assurance program for the installation of the liner system? What thickness of HDPE liner will be used? What area will be covered by the HDPE and 1-foot bentonite-treated material? How many permeability, moisture, density, and field compaction tests will be performed at the site? It is unlikely that the proposed 1-foot bentonite treated material can be constructed properly. Based on industry experience, 18 to 24 inches is the minimum thickness required for a quality liner construction. The revised draft EIS should address all of these issues.

15

5-49

The stated permeability requirement of 1×10^{-6} cm/sec for the 1-foot bentonite clay liner does not constitute an impermeable barrier. The revised draft EIS should quantify the leachate volume that will penetrate to groundwater using an effective permeability of 1×10^{-6} cm/sec for the clay liner. The revised draft EIS should discuss leachate analytical results for RCRA Appendix IX parameters for BFI's existing Corinda Los Trancos Canyon landfill. The actual chemical composition of the leachate must be used to project worst case impacts on groundwater and surface water in Apanollo Canyon.

5-50

The construction of a grout curtain is discussed on page 3-43 as a design feature to minimize leachate migration. The revised draft EIS should specify the type of grout curtain to be used on the containment wall. Cement grouts, in general, are not effective in sealing granular materials. Chemical-based grouts contain hazardous components that can leach to groundwater and surface water. A RCRA Appendix IX analysis should be presented for the proposed grout materials.

5-51

Industry experience also indicates that grout curtains are not very effective in reducing downgradient flows of groundwater or leachate. Grout curtains only slow the movement of groundwater and, hence, can increase gradients across the grout curtain. The net effect is little, if any, reduction in quantity of leachate flow downgradient. Grout curtains typically reduce permeability by about one order of magnitude, or less, depending on the design. Given the potential for downgradient movement of leachate and groundwater through the grout curtain, the revised draft EIS should address the effectiveness of this method and calculate the impact of leachate flow on sensitive fish habitat and spawning areas downgradient.

5-52

FAULTING AND SEISMICITY

The draft EIS is incomplete in its description of faulting and is simplistic in its analysis of seismic design for the Apanollo Canyon 1,200-foot alternative. The draft EIS does assume a maximum probable earthquake event of Richter Magnitude (M) 8.3 for the San Andreas fault, which is appropriate. However, the determination of horizontal ground acceleration appears to be understated. In general, there is inadequate documentation of the findings.

5-53

Faulting

The listing of major active faults in the region (page 4-1) is incomplete. Besides the San Andreas, Hayward, and Calaveras faults, the San Francisco Peninsula region includes the Seal Cove, San Gregorio-Hogri, and Palo Colorado faults. It also should be noted that the Seal Cove and San Gregorio-Hogri faults are distinct faults that are capable of generating separate earthquake events (although the Seal Cove fault is inferred by many to join with the San Gregorio-Hogri fault to the south).

5-54

Potentially active faults are listed as the Pilarcitos, San Mateo, and La Honda faults. It is stated in the draft EIS (page 4-3) that the potential for severe ground shaking from potentially active faults at Apanollo Canyon is less than for the recognized active faults. However, no justification for this determination is provided. The San Mateo and La Honda faults are not indicated on a location map (e.g., Figure 4.1-1).

5-55

16

5-56

The draft EIS indicates that investigations in the area of Apanollo Canyon reveal no evidence of "major faulting" (page 4-11). The term "major" is not defined, and "minor" faulting is not considered. Minor faulting could be critical to the siting of a landfill, especially if the fault activity is recent.

5-57

The draft EIS indicates the presence of several small, older faults in the area that exhibit slight offsets (page 4-10). However, no description or location is provided for these faults, nor is the age determination (i.e., "older" classification) methodology specified. Active or inactive faults under a landfill could cause seismic activity that breaches the liner and containment systems, resulting in the release of leachate to groundwater or surface water. The draft EIS does not describe any age-dating of active or inactive faults within the canyon area and, therefore, does not and cannot address potential environmental impacts.

Horizontal Ground Acceleration

5-58

The draft EIS states that the maximum probable bedrock acceleration is 0.5 gravity (g) at the site. Supporting documentation (by letter, Daniel J. Rhoades, Purcell, Rhoades & Associates, to Roger B. James, RWQCB, 29 January 1988, "Response to Regional Water Quality Control Board letter of July 20, 1987--Application for Exemptions, Apanollo Canyon Expansion Site, Ox Mountain, San Mateo County, California") indicates that a "very conservative 'worst case' condition" maximum acceleration value of 0.6g also was evaluated (page 16). The magnitude of these values requires further justification, as they appear to underestimate the maximum acceleration that could be expected for the site. Algermissen et al. (1982) indicate a 0.74g maximum acceleration along the trace of the San Andreas fault. Apanollo Canyon is only 2.7 miles distant from the San Andreas fault. Therefore, a maximum acceleration on the order of 0.7g should be assumed. Algermissen et al. (1982) indicate a maximum acceleration for the site area of more than 0.6g.

5-59

The draft EIS references the 1986 Purcell, Rhoades and Associates geotechnical investigation that relates the performance of Sunshine Canyon Landfill during the 1971 San Fernando earthquake (M 6.6) to the expected performance of the Apanollo Canyon site. Maximum ground acceleration for the Sunshine Canyon Landfill site was estimated at 0.45g. Such a comparison is incorrect, considering the discrepancy in magnitude and acceleration values between Sunshine Canyon Landfill and Apanollo Canyon noted herein (i.e., > 0.6g).

Seismic Design Modeling

5-60

Dynamic analysis, using the SHAKE program, was performed for the proposed Apanollo Canyon landfill expansion (by letter, Daniel J. Rhoades, Purcell, Rhoades & Associates, to Roger B. James, RWQCB, 29 January 1988). A 520-foot column of landfill material and ground accelerations of 0.5g and 0.6g were used in the evaluation. Insufficient data are provided in the draft EIS to evaluate the adequacy of the modeling/analysis. However, it is evident that the model oversimplifies the proposed landfill design. A one-dimensional vertical model (520-foot column) is used to represent the landfill, thus excluding the three-dimensional reality of the site, including influences from canyon sidewalls and variable thicknesses of the landfill (which are less than 520 feet in almost all cases). The conclusion presented that severe dampening will occur is erroneous. Using the same reasoning, a landfill situated directly above the epicenter of the largest of earthquakes can survive safely so long as it is thick enough (i.e., probably measured in miles) to dampen shaking.

5-61

In addition, seismic studies cited in the draft EIS (page 4-11) are at odds with the conclusions of the seismic design modeling. The studies indicate that in the event of a large magnitude earthquake affecting San Mateo County, the intensity of seismic shaking may be higher in sediment filled portions of canyon than in areas underlain by bedrock. This suggests that seismic shaking at the landfill (which essentially is a sediment-filled canyon) may be higher than in surrounding areas, not dampened substantially as suggested by the modeling.

5-62

The effect of a postulated large earthquake on the proposed Apanollo Canyon Expansion could be severe. Most catastrophic of all would be slope movement along slippage planes within the landfill or at the toe of the landfill. Less severe movement, consolidation, and settling could rupture the landfill liner and render inoperable the underdrain system.

The statement that the landfill liner, leachate, and water-management systems have been designed to withstand the maximum probable earthquake (M 8.3) on the nearby San Andreas fault (page 5-6) appears to be unfounded. The landfill, as designed, likely would be affected severely by such an earthquake.

TRANSPORTATION, NOISE, AND POPULATION

Transportation

5-63

The draft EIS (pages 5-40 and 5-41) does not present a basis for assuming that traffic volumes on Highway 92 will increase proportional to total population increases. Significant increases in traffic can occur as a result of a single industrial, commercial, or residential development. The traffic analysis prepared for the Apanollo Canyon 1,200-foot alternative assumes that additional lanes for truck traffic on Highway 92 between 1-280 and the landfill will be in place by 1995. The baseline condition in the draft EIS should represent current conditions and should not assume any improvements. A "worst case," in part, would be if these improvements are not completed.

5-64

The necessity to upgrade Highway 92 via the provision of a truck lane and/or automated traffic controls could be a component of a transportation mitigation program. The cost of installing such upgrades should be borne by the applicant, not by County and/or State governments. These costs should be incorporated into the economic appraisal of the 1,200-foot alternative in the revised draft EIS.

Noise

5-65

Section 4.6 of the draft EIS does not define adequately the locations of sensitive noise receptors. The draft EIS states on page 4-80: "There are several residences along Highway 92 in the vicinity of the access road leading to the Corinda Los Trancos landfill." This and the accompanying anecdotal description of sensitive receptors does not represent a quantitative sampling of potential noise receptors on which to base a noise impact analysis. The existing noise conditions that were monitored for this study should have been based on actual distances to sensitive receptors (including outdoor recreational areas and residences) along all of the routes expected to experience truck traffic increases.

Population

5-66

The information presented in Section 4.12 (pages 4-106 and 4-107) regarding population projections is inadequate. Because the population projections form the basis for other environmental impact analyses, such as traffic, air, and noise impacts, it is important to provide the best available information from reliable sources. Population projections that have been developed by San Mateo County and the State of California should be presented and compared to those used in this study. The assumptions on which the population projections are based also should be evaluated.

AIR QUALITY

5-67

The draft EIS does not present a credible analysis of the potential air quality impacts due to construction and operation of the proposed Apanollo Canyon 1,200-foot alternative. Section 4.5 should include wind rose diagrams to assess potential movements of air contaminants. Information on the generation of volatile organic compounds at the existing Corinda Los Trancos Canyon facility should be presented in the EIR to establish the presence or absence of impacts to air quality from the proposed landfill.

5-68

The revised draft EIS should include (in Section 5.5) a quantitative analysis of the potential for releases of hazardous, flammable, or odorous gases from the proposed landfill. The revised draft EIS should discuss whether nearby residents and the City of Half Moon Bay would be impacted by volatile organics and odors emitted from the landfill as well as emissions from increased truck traffic. The emission estimates should be calculated using various meteorological conditions, such as truck exhaust during times of inversion episodes and daily air movements down-canyon to Half Moon Bay. This down-canyon movement of air is a common climatological occurrence in this area of the California coast and could have measurable environmental effect. Down-canyon movement of landfill gas potentially could present a health risk to Half Moon Bay residents. Given the 93-year active life, and the absence of data in the draft EIS concerning landfill gas generation and composition, a health risk assessment should be conducted. In addition to potential impacts on the existing population, the risk assessment should consider future residential and commercial development in areas proximate to the proposed site.

5-70

5-71

Section 5.5 notes that a methane recovery system will be required by Bay Area Air Quality Management District regulations. No design details of the recovery system are provided, nor is the method of methane venting/treatment described. The revised draft EIS should describe the recovery system and any provisions to control dust emissions. It should present an emissions analysis that includes contributions from the methane recovery system (e.g., flares or waste-to-energy equipment) and fugitive landfill gas emissions.

5-72

Although an "Abstract" and USACE cover letter are provided in the draft EIS, they do not meet the information requirements contained at 40 CFR 1502.10 and 1502.11. The revised draft EIS should feature an appropriate cover page. Likewise, Section 8.0 of the draft EIS (i.e., "List of Preparers") does not

5-73

5-73

include the qualifications of the listed individuals, nor are their contributions (except for "EIS review") specified. These omissions are in direct conflict with 40 CFR 1502.17, as well as with the USACE's published procedures. The qualifications of the ecological investigators, and especially of the author(s) of the Mitigation Plan, are particularly important given the gross inadequacies displayed in those portions of the draft EIS. Most significantly, the discussion of the impacts of the alternatives (Section 5.8) does not consolidate the comparative evaluations required by Sections 102(2)(c)(ii), (ii), (iv), and (v) of the National Environmental Policy Act (NEPA). Therefore, a revised draft EIS must be prepared and recirculated owing to these shortcomings alone (see 40 CFR 1502.9).

5-74

REFERENCES

- Algermisen, S. T., D. M. Perkins, P. C. Thenhaus, S. L. Hanson, and B. L. Bender. 1982. Probabilistic estimates of maximum acceleration and velocity in rock in the contiguous United States, US Geological Survey Open-File Report 82-1033.
- Schroeder, P.R., A.C. Gibson and M.D. Smolen. 1984. The Hydrologic Evaluation of Landfill Performance (HELP) Model, US Environmental Protection Agency, Washington, D.C.
- Wong, J. 1977. The design of a system for collecting leachate from a lined landfill. Water Resources Research, Vol. 13, No. 3.

Karen Garrison
2222 Ninth Ave.
Oakland, CA 94606

TESTIMONY ON BEHALF OF URBAN CREEKS COUNCIL
AND THE NORTHERN CALIFORNIA COUNCIL PRESERVATION OF FLYFISHERS

SUBJECT: DRAFT EIS - ORO MOUNTAIN SANITARY LANDFILL
APANOLIO CANYON EXPANSION SITE

The Urban Creeks Council is an organization with 17 affiliates throughout California. As a statewide organization we recognize how rare the resource Browning Ferris Industries proposes to fill is becoming in this state. Because of Apanolio Canyon's remoteness, size, and the fact that it has not been broken up into smaller parcels with many disturbed peripheries, it supports a high level of biological diversity and productive riparian habitat (note EIS p. 5-25). The stream and wetland resource is of higher value by orders of magnitude than that of neighboring, more disturbed canyons. Yet the EIS systematically plays down this difference (in Table 1.3-1, under "Biology" no mention is made of the relatively pristine state of this riparian resource compared to that of other canyons, nor is any mention made of the quality of Apanolio's aquatic and riparian habitat in the summary).

We were not particularly surprised when the County certified an inadequate EIR two years ago. Politicians are notoriously shortsighted, and I'm not faulting individuals but simply commenting on the nature of the political system. When the Corps determined the need for an EIS, we had hoped for a more useful and defensible document. We were disappointed to find, instead, another thinly disguised argument for the project, and one that does more to obscure the differences between alternatives than to aid decision makers.

We rely on you, the Corps, to take the longer view and conduct an impartial comparison of alternatives, as required by the federal 404(b)(1) guidelines (see Federal Register Vol. 45, No. 249, Section 230.10). According to these guidelines, no discharge of fill material shall be permitted for a non-water-dependent purpose if there is "a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem...An alternative is practicable if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes." The issue here is not whether a landfill should be sited, but whether Apanolio Canyon is the best practicable alternative. We believe that a more thorough evaluation of alternatives will reveal options that would reduce the environmental, and ultimately the social, losses to the County and to the State.

Given the time limits, we will restrict our discussion of the deficiencies in the EIS to the following subjects: (1) bias in the selection of alternatives; (2) inadequate evaluation of the alternatives selected; (3) inadequate mitigation; and (4) misleading comparisons of project economics.

Bias in the Selection of Alternatives

6-2

The alternatives are all, with the exception of the no-project option, similar in kind. They involve filling canyons in the high rainfall area of San Mateo County where such a project would cause unavoidable losses of water resources and be difficult to engineer for protection of the larger watershed.

6-3

The EIS should evaluate (not mention and dismiss) the option of disposal in an out-of-county site, preferably in a drier area such as Altamont, where proposals are in the works to expand capacity to 300 years.

6-4

The EIS should consider the possibility of negotiating an interim agreement for disposal at an out-of-county site to allow more time for environmental review of another proposal. An interim arrangement could probably be arranged far more easily than a long-term agreement.

6-5

The EIS should make a comprehensive effort to build a practicable alternative out of a number of promising possibilities, making a bona fide effort to find another option that might work. Instead it wastes time evaluating straw projects like partial fill of Apanolio Canyon that reduce none of the water resource impacts of the project. Tom Nolan spoke of the assiduous efforts of the county to plan landfill sites, yet the record shows that no studies were conducted between 1963 and 1987. The 1987 search appears to have been a pro forma effort necessary to allow the Apanolio Canyon project to proceed.

6-6

An example of such an alternative might be a combination of an interim agreement with Altamont or some other existing landfill, full implementation of a recycling plan (extending the life of a site by as much as 30%), and a plan for the cooperative management of the Nuff Canyon as a quarry and landfill site.

Inadequate Evaluation of Selected Alternatives

6-7

The evaluation of alternatives selected is inadequate, both for the purposes of comparing impacts and for determining practicability. The Nuff Canyon site appears to be preferable to Apanolio on many counts. The EIS suggests that there is no significant fishery. The canyon and presumably some of the riparian habitat have already been disturbed. A landfill site there would consolidate two projects that degrade natural ecosystems in one canyon. And a smaller amount and lower quality of wetlands and stream would be filled. Yet the water quality of this stream was not surveyed for this EIS, nor are the vegetation and habitat values adequately characterized. No effort was made to investigate the possibility of extending the life of the project through recycling plans or through joint management of the site. No attempt was made to investigate possible mitigation for increased traffic problems or through joint management of the site. No effort was made to document the ownership status. Given these deficiencies it would be difficult to substantiate that no practicable alternative to Apanolio exists.

Impacts of the Project Are Not Mitigated

The conclusion, implied in this document, that the loss of this resource can be mitigated does not follow from the analysis. We hold that the loss of a trout stream of the quality of Apurilico Creek cannot be mitigated in its entirety. Compensation for a few specific habitat functions does not add up to a replacement for the creek. Examples of specific problems with the mitigation plan are:

- o No mitigation has been offered for the two thirds of a mile of continuous flowing stream that provides not only spawning habitat but also rearing habitat for rainbow and potentially steelhead trout.
- o The mitigation plan assumes that Apurilico Creek does not qualify as a steelhead stream because migration is now made difficult in all but high flow years by the presence of barriers introduced by the landowners. A problem that could be corrected easily by the introduction of fish ladders should not define the parameters of the mitigation plan.
- o Piecemeal mitigation projects will not substitute for the value of an uninterrupted stream as aquatic and riparian habitat.
- o The proposed mitigation fish ladders and increase in cover on Pillaritos are necessary and admirable improvements to the larger watershed, but these measures should be carried out to compensate for improper management of those watersheds, not serve as mitigation for this project.
- o It is unacceptable to stop monitoring the effectiveness of mitigation for a loss in perpetuity after only 5 years.
- o No evidence has been provided in the IIS to substantiate the necessity for or value of the proposed burn program for coastal scrub.

Misleading Comparison of Project Economics and Miscellaneous

An unacceptable mitigation plan, budgeted at \$350,000 (Appendix A, p. 26) admitted, would add little to the total project construction cost of \$129.4 million. A more reasonable mitigation plan could increase project costs substantially and might make the total cost of constructing a landfill in Apurilico Canyon compare less favorably with that of other alternatives. Estimates used to compare the projected costs of the alternatives (e.g. costs per ton on pp. 5-8) to 5-88) should include potential mitigation costs.

The members of the Urban Creeks Council find it difficult to believe that the remarkable beneficial uses of Apurilico Canyon have in effect been valued at less than 0.3 percent of the cost of a garbage dump.

The chart on p. 3-13 appears to compare the cost of out-of-county landfill disposal with that of current Ox Mountain disposal costs instead of the costs of Apurilico Canyon. The documentation of this chart does not allow meaningful interpretation of the numbers.

6-11

The section on Short-Term Uses vs. Long-Term Productivity (p. 5-94 of the IIS) should be altered to indicate that this project offers a temporary solution to the problem of garbage disposal at the expense of the permanent elimination of irreplaceable aquatic and wildlife habitat and stream resources.

Conclusion

We hope that the selection of additional alternatives as well as an expanded evaluation of the most promising options (Muff Canyon, Corunda Forefill, out-of-county site or combination of the above) makes a valid comparison of alternatives possible in the final version of this IIS.

6-12

SUPERVISOR TOM HUENING

July 7, 1988

Colonel Galen H. Yaragihara
District Engineer
U.S. Army Corps of Engineers
211 Main Street
San Francisco, CA 94105-1905

RE: COMMENTS ON DRAFT ENVIRONMENTAL IMPACT STATEMENT OX MOUNTAIN
SANITARY LANDFILL, APANOLIO CANYON EXPANSION SITE
(REGULATORY PERMIT APPLICATION NO. 16611591)

Dear Colonel Yaragihara:

Due to a prior commitment, I am able to remain for only the beginning portion of your July 7th public hearing. Therefore, I want to express a few thoughts in writing, to be considered with the other testimony.

I'd like to make just three points:

1. For over 25 years, Ox Mountain Ranch has been specified as the solid waste facility for San Mateo County -- first Los Trancos, and then Apanolio Canyon. Unlike some jurisdictions, San Mateo County has planned ahead for its solid waste disposal.
2. The existing BFI operation is well run, and has an excellent environmental record.
3. The new Apanolio site is the most favorable in the County, based on environmental, safety and economic considerations.

I urge you then, to complete your analysis and deliberation with all due speed. Even with our ambitious recycle program, we have but a scant year to prepare and put our sorely needed Apanolio expansion into operation.

I would appreciate your favorable consideration.

Yours truly,


TOM HUENING
Supervisor

San Mateo County, Hall of Justice and Records, Redwood City, California 94063
Countywide 726-5561 - Central County 873-2222 - North County 873-1800 - Direct Line 343-4544

California State Department of Fish and Game

Colonel Galen Yanagihara
Corps of Engineers
Department of the Army
San Francisco District
211 Main Street
San Francisco, California 94105-1905

July 2, 1988

Re: Public Notice No. 166111591; Draft Environmental Impact Statement; Ox Mountain Sanitary Landfill, Apanolio Canyon Expansion Site; Apanolio Creek, San Mateo County; Comments by California Sportfishing Protection Alliance to Draft EIS.

Dear Colonel Yanagihara:

We have reviewed the Public Notice and the draft EIS for the above mentioned project. The CSPA is a statewide organization representing California anglers who seek the preservation, protection and enhancement of the fishery resources of the state of California. We have standing with numerous state and federal agencies, including the Corps of Engineers. The following are our comments concerning the draft EIS and the proposed project:

1. Browning-Ferris Industries (BFI) has applied to the Department of the Army for authorization to place fill in association with various structures for the development of a sanitary landfill in Apanolio Canyon. The proposed project will eliminate 5,600 feet of Apanolio Creek.

JFI currently operates a landfill site at Ox Mountain Ranch, located 3 miles from Half Moon Bay. The Ox Mountain Ranch consists of two principle canyons. The canyons are the Corinda Los Trancos Canyon and Apanolio Canyon. The land fill in Corinda Los Trancos canyon has been used since 1976, and will reach design capacity within two years. BFI proposes to expand the existing operation westward into the adjacent Apanolio Canyon. The applicant alleges that other landfills in San Mateo County are reaching capacity and have limited capacity and no expansion potential.

The Apanolio Canyon Expansion Site is 285 acres in the upper portion of the canyon. Apanolio Canyon is a steep, narrow watershed on the coastline of San Mateo County (Pilarillos Creek Watershed). The proposed project would fill the canyon from a 500 foot elevation to a 1200 foot elevation, with an average depth of 185 feet of sanitary fill. Access to the proposed landfill will be from Highway 92 through the present Corinda Los Trancos gate. BFI alleges this site has the capacity to serve as a solid waste disposal facility for the county of San Mateo until the year 2084.

1

8-1

2. Apanolio Creek's pool and riffle reaches within the proposed landfill site support important and valuable steelhead trout populations, including very valuable spawning and rearing habitat. According to a recent study conducted by the Department of Fish and Game, a total population estimate of 1,502 steelhead trout per mile of stream was calculated for the lower section of Apanolio Creek within the project area.

8-2

3. Final depths of fill will be up to 700 feet with the entire site accepting approximately 21 million cubic yards of grading material and 124 million cubic yards of solid waste. Long term major adverse impacts to the aquatic resources in Apanolio Creek will occur from the proposed project due to converting the existing streambed substrate to layered refuse and upland soil. This long term major impact to the aquatic resources in this stream reach will also have cumulative related long term adverse impacts to the steelhead trout fishery because of the total elimination of food production (aquatic resources) habitat in this stream reach.

8-3

4. This proposed project will eliminate 5,600 feet of Apanolio Creek. Long term adverse major impacts will occur to the fishery and aquatic resources of Apanolio Creek due to the rerouting of natural runoff and streamflow in the upper portion of the watershed around the landfill, and converting Apanolio Creek into 5,600 feet of closed pipe. The closed conduit will not sustain natural habitat to maintain and support the fishery and aquatic resources effected by the proposed project (all life stages).

8-4

5. Clearing vegetation and other construction associated activities would result in adverse impacts to water quality due to increased erosion of steep hillsides and sedimentation into the downstream areas of the state's waters. Construction activities previously done have had a significant noticeable increase of siltation in Apanolio Creek. The proposed project will cause long term adverse impacts to water quality, fisheries habitat and aquatic habitat in the downstream areas of the state's waters. I.e. sedimentation impacts cause adverse impacts to spawning and food producing habitat.

8-5

6. The long term adverse impacts to the fishery and aquatic resources of Apanolio Creek is not reasonable, and also is not in the public interest. The proposed project will violate policies adopted by the California Legislature which protect aquatic and fishery resources.

Section 1700 of the California Fish and Game Code states in pertinent part:

Chapter 7. Conservation of Aquatic Resources

Section 1700 - "It is hereby declared to be the policy of the state to encourage the conservation, maintenance, and utilization of the living resources of the ocean and other waters under jurisdiction and influence of the state for the benefit of all the citizens of the state and to promote the

development of local fisheries and distant-water fisheries based in California in harmony with international law respecting fishing and the conservation of the living resources of the ocean and other waters under the jurisdiction and influence of the state. This policy shall include all of the following objectives:

- (a) The maintenance of sufficient populations of all species of aquatic organisms to insure their continued existence.

8-6

Section 1600 of the California Fish and Game Code states as follows:

Section 1600. - Chapter Purpose

"The protection and conservation of the fish and wildlife resources of this state are hereby declared to be of utmost public interest. Fish and wildlife are the property of the people and provide a major contribution to the economy of the state as well as providing a significant part of the people's food supply and therefore their conservation is a proper responsibility of the state".

The proposed project will eliminate 5,600 feet of valuable habitat for steelhead trout and will reduce steelhead trout population levels. The proposed project will also impact downstream habitat for steelhead trout and reduce steelhead trout population levels.

8-7

7. Fish are the property of the people of the state of California, and are a public trust resource. The use of the waters of Apanolio Creek for the preservation and enhancement of the fishery resources is the beneficial use of the state's waters.

Section 1243 of the California Water Code states in pertinent part:

"The use of water for recreation and preservation and enhancement of fish and wildlife is a beneficial use of water."

The proposed project will adversely effect the beneficial use of the waters of Apanolio Creek because of adverse impacts to the steelhead trout fishery resources from the proposed project.

8-8

8. The proposed project is the unreasonable use and unreasonable method of use of the waters of Apanolio Creek because of adverse impacts to the fishery resources from the proposed project. The proposed project will eliminate 5,600 feet of natural streambed, and will also eliminate 40% of the natural streamflows in Apanolio Creek during the critical low flow period.

Section 275 of the Water Code states as follows:

3

"The department and board (State Water Resources Control Board) shall take all appropriate proceedings or actions before executive, legislative, or judicial agencies to prevent waste, unreasonable use, unreasonable method of use, or unreasonable method of diversion and use of water in this state."

This project will result in a violation of Section 275 of the Water Code.

8-9

9. On May 15, 1987, the California Division of Water Rights noticed an application to appropriate water from Apanolio Creek. The application number was 28086. The applicant was BFL. The purpose of the application was to divert 0.16 cfs of water from Apanolio Creek for industrial purposes from January 1 to December 31 annually for the proposed Ox Mountain Sanitary Landfill. The California Sportfishing Protection Alliance filed a formal protest with the State Water Resources Control Board on May 29, 1987 against the application on environmental grounds. On August 7, 1987, the California Division of Water Rights filed a notice cancelling the application. The notice stated that "A request has been received by, or on behalf of, applicant that the application be cancelled".

Section 102 of the California Water Code states:

Section 102. - "All water within the State is the property of the people of the State, but the right to the use of water may be acquired by appropriation in the manner provided by law".

Section 105 of the California Water Code states:

Section 105. - "It is hereby declared that the protection of the public interest in the development of the water resources of the State is of vital concern to the people of the State and that the State shall determine in what way the water of the State, both surface and underground, should be developed for the greatest public benefit".

The proposed project will violate Sections 102 and 105 of the Water Code. The Corps is required to comply to state law.

The Corps of Engineer should not issue a permit for the proposed project until the applicant resubmits an application for water rights, and receives a conditioned water rights permit from the State Water Resources Control Board to use said water from Apanolio Creek in accordance with Sections 102 and 105 of the Water Code, and other applicable state laws and regulations. The Corps is required to comply to state law when approving permits.

10. The proposed project will violate Section 5943 of the California Fish and Game Code.

8-11

4

Section 5948 states as follows:

Section 5948. - Log jams, artificial barriers - unlawful

"No person shall cause or having caused, permit to exist any log jam or debris accumulation or any other artificial barrier, except a dam for the storage or diversion of water, public bridges and approaches thereto, groins, jetties, seawalls, breakwater, bulkheads, wharves and piers permitted by law, and debris from mining operations, in any stream in this State, which will prevent the passing of fish up and down stream or which is deleterious to fish as determined by the commission, subject to review by the courts".

The proposed project will impede the upstream migration of steelhead trout and will result in a violation of Section 5948 of the California Fish and Game Code.

8-12

11. The proposed project will eliminate and destroy over 285 acre of Apanolio Creek Canyon, including the riparian zone bordering Apanolio Creek and old growth Douglas fir. The wildlife resources these areas support will be lost. The landfill may potential eliminate habitat for the endangered San Francisco Garter Snake.

The Corp cannot authorize a project which will alter habitat for an endangered species under the requirements of the Endangered Species Act. There must be conducted long term studies which provide full assurance to the public that the project will not alter habitat being used by the San Francisco Garter Snake. The CSPA recommends a long term study to determine if the proposed project will alter habitat for the San Francisco Garter Snake. The CSPA recommends that studies be conducted in cooperation with the Endangered Species Office of the U.S. Fish and Wildlife Service to determine whether the proposed project will alter habitat for the San Francisco Garter Snake. The Corp should delay issuance of the permit until the studies have been completed and recommendations made to the Corps by the U.S. Fish and Wildlife Service.

Section 1755 of the California Fish and Game Code states in pertinent part:

Chapter 7.5 - Native Species Conservation and Enhancement

Section 1755. - Findings.

"The Legislature finds and declares all of the following:

(a) That it is the policy of this state:

5

(1) To maintain sufficient populations of all species of wildlife and native plants and the habitat necessary to insure the policies stated in paragraph (2), (3), and (4).

(2) To provide for the beneficial use and enjoyment of wildlife and native plants by all citizens of the state.

(3) To perpetuate native plants and all species of wildlife for their intrinsic and ecological values, as well as for their direct benefits to man.

(4) To provide for aesthetic, educational, and nonappropriative uses of the various wildlife and native plant species".

8-13

The proposed project violates the policy declared by the California Legislature in protecting and maintaining wildlife and native plant species. The proposed project will eliminate 285 acres of native plants, and will eliminate important habitat for wildlife population. This is unreasonable and not in the public interest.

8-14

12. The proposed project will effect the streamflow in Apanolio Creek within the project area by 40% during the critical low flow periods, and will also have related impacts to steelhead habitat in Apanolio Creek directly below the project area. Subsequently the proposed project will consumptively use approximately 0.02 cfs of the state's waters.

8-15

The proposed project may also adversely effect a legal water user in Apanolio Creek below the project area. The name of the legal water user is Mr. Ronald D. Bongard. A 40% reduction in summer flows has been predicted in the draft EIS. After diversions by Mr. Bongard, the amount of remaining water in Apanolio Creek may not be sufficient to maintain the steelhead fishery resources below his point of diversion.

8-16

The draft EIS is deficient. The draft EIS does not provide any information and data from site-specific scientific fishery studies which determines the potential impacts to the steelhead fishery habitat within, and directly below the project area from reductions in streamflows caused by the project during the critical low flow periods.

8-17

The applicant should be required to conduct instreamflow fishery studies using the Instream Flow Incremental Methodology (IFIM) to determine the minimum amount of water necessary to protect the steelhead fishery within and directly below the project area, and also directly below Bongard's diversion. Loss in habitat from reductions in streamflow caused by the project during critical low flow periods could potential adversely eliminate or alter steelhead population levels.

13. The proposed project will result in violations of land use objectives in rural lands in San Mateo County.

6

8-18

a) The proposed project will violate the objective to protect and conserve vegetation, water, and fish and wildlife resources of Apanolio Creek.

8-19

b) The proposed project will violate the objective to protect and enhance the unique scenic quality and pastoral character of Apanolio Canyon.

8-20

c) The proposed project will violate the objective of having the State Water Resources Control Board determine fishery and instreamflow protection measures for Apanolio Creek. The Board has the jurisdiction and authority in managing the state's waters, and is also responsible for protecting the public trust fishery resources of Apanolio Creek.

8-21

14. The elimination of a viable steelhead trout stream to accommodate a landfill operation is not in the public interest, and would establish an unacceptable precedent. The proposed project places the quality of the state's waters and other beneficial uses (Apanolio Creek, Pilarcitos Creek and Half Moon Bay) at serious adverse environmental risk from potential contamination in the long term future. It would be unreasonable and not in the public interest for the Corps to approve a permit for a project which may very well jeopardize the quality of the state's waters, the steelhead trout fishery, and a legal downstream water user.

8-22


15. The draft EIS is deficient. The alternative sites selected in the draft EIS are not acceptable. The draft EIS should identify in full detail other alternative sites, including alternative sites now in use which can be used in the interim in the event the application for Corps permit is denied.

8-23

16. The off-site mitigation measures proposed by BFI are not acceptable. The California Department of Fish and Game can implement on their own accord many of the off-site mitigation measures proposed by the applicant without eliminating a viable steelhead stream.

Please provide this writer at the address listed below with a copy of the supplemental draft EIS for the proposed project. We would appreciate the Corps addressing all of the legal (state, law) and biological considerations and recommendations as cited in this letter of comment.

Sincerely


Robert J. Batocchi, Executive Director, CSPA
1859 Salida Way
Paradise, CA 95969
Tel: 916-872-9266 (Office)

7

cc:

Mr. Walter Pettit, Chief
Division of Water Rights
State Water Resources Control Board

Mr. Peter Bonladelli, Director
Mr. John Turner, Supervisor, Environmental Services
California Department of Fish and Game, Main Office

Mr. Brian Hunter, Regional Manager, Region 3
California Department of Fish and Game

Mr. James McKeivitt, Supervisor
U.S. Fish and Wildlife Service

Mr. James Burns, Chief Deputy Director
California Coastal Commission

Mr. James Bybee, Fisheries Biologist
U.S. National Marine Fisheries Service

Mr. Charles Murray Jr., Assistant Regional Administrator
U.S. Environmental Protection Agency

Mr. Roger James, Executive Officer
CPWQCB, San Francisco Region

Mr. Robert Treanor, Asst. Executive Secretary
California Fish and Game Commission

Mr. James Crenshaw, President, CSPA

Mr. Michael Jackson, Counsel, CSPA

Mr. Jerry Bliss, President, SWCFFF

Mr. Hamilton Candee, Senior Project Attorney
Natural Resources Defense Council

Mr. Laurens H. Silver, Attorney
Sierra Club Legal Defense Fund, Inc.

CSPA Board

Ms. Judith Goldsmith
Sierra Club Urban Creeks Task Force

Interested Parties

8

July 14, 1963

Col. Galen H. Yanagihara, District Engineer
U. S. Army Engineer District, San Francisco
211 Main Street
San Francisco, Ca. 94105-1905

Attn: Regulatory Branch

Subject: Comments regarding the Draft Environmental Impact
Statement For the Proposed Expansion of the Ox Mountain
Sanitary Landfill

(Regulatory Permit Application No. 16611591)

Applicant: Browning-Ferris Industries
San Mateo County District
P.O. Box 1068
San Carlos, Ca. 94070

Dear Col. Yanagihara:

As a property owner downstream of the proposed expansion of the Ox Mountain Landfill in Apanollo Canyon, I am very much concerned about the impact this will have on my water supply both in quality and quantity. We have a nursery and water is a most important resource in our operation. Without water we cannot function. Apanollo Creek has given us a quality supply of water for many years, serving both our domestic and agricultural needs.

In regards to our domestic needs, I will reiterate what I have stated in earlier correspondence. Apanollo Creek supplies water to our home. If there is degradation of our water supply, who will replace it? We have no municipal water supply.

From an agricultural standpoint, I would like to know how we are to be compensated should our supply be curtailed with the enclosure of one side of Apanollo Creek in a culvert, the reduction of wetland area and removal of vegetation that would normally enhance water retention. I would need an immediate replacement of a water supply or I would be forced out of business. By the way, we have been here since 1945. I could not survive through years of litigation in order to have my water supply restored.

How is our water supply to be measured? We have a concrete lined reservoir which is part of the old water supply system that served the needs of Half Moon Bay years ago. This reservoir holds about three acre feet of water. In the course of a year, this reservoir is emptied and refilled about one hundred fifty to one hundred seventy times. For about the last twenty-three years, we have been reporting the amount of water we use to the State Water Resources Control Board in Sacramento. In a publication by Furcell, Rhoades & Associates entitled "Hydrological Assessment An Water Resources Beneficial Use Analysis Apanollo Canyon Expansion 211 Ox Mountain San Mateo County, California For Browning-Ferris Industries of California, they seriously question the amount of water used that is reported to the State Water Resources Control Board in Sacramento.

The validity of water usage reports to the State Water Resources Control Board is doubted. I have lived here all my life and feel that I personally know more about how much water I use than anyone else.

In the Draft E.I.S. under Wildlife and Fisheries Mitigation Plan, Appendix B, page 14 & 15, it states that B.F.I. has received landowner permission to modify existing dams for enhancing fish life. This is a fallacy. At no time have I given verbal or written permission to make the necessary modifications. This mitigation plan for wildlife was prepared by Ralph Osterling Consultants. I have never met Ralph Osterling nor has he ever asked permission to make inspections of my dams which he discusses in his mitigation plan.

The Draft E.I.S. appears to support another argument in favor of the Landfill Expansion into Apanollo Canyon without thorough consideration of alternate landfill sites.

In addition to taping a virgin wilderness, this expansion will down grade property values of those in the immediate area of the landfill site.

I understand that the disposing of garbage is a serious problem, but I hope you will give serious thought to the ultimate impact that garbage will have on Apanollo Canyon.

Sincerely yours,

Ronald D. Bongard
Ronald D. Bongard



THE PENINSULA FLY FISHERS, INC.

P.O. Box 881
San Carlos, California 94070
July 14, 1988

Col. Galen H. Yanagihara
U.S. Army Corps of Engineers
Department of the Army
San Francisco District
211 Main Street
San Francisco, CA 94105-1905

Re: Application No. 16611S91; DEIS for the Ox Mountain
Sanitary Landfill, Apanolio Canyon Expansion Site. Browning
Ferris Industries.

Dear Col. Yanagihara,

The Peninsula Fly Fishers (PFF) is a 100 plus member
angling organization in central San Mateo County which
is biased toward the preservation of steelhead trout
because of their superior fly fishing attributes. We
are concerned with the loss of any viable trout and
steelhead trout habitat, especially the loss of spawning
and rearing stream beds. We are probably the closest
and most involved of the angling clubs to be affected
by the loss of approximately one mile of Apanolio Creek
as habitat. We are also members of the Northern California
Council Federation of Fly-Fishers (NCCFFF) and California
Sportfishing Protective Alliance (CSPA).

We have studied the DEIS referred to above, and
have been peripherally acquainted with the Ox Mountain
land fill project for some time. We have also carefully
reviewed the submissions of both NCCFFF and CSPA on the
subject and strongly support their positions.

Sincerely,

Donald R. Slaiter

Donald R. Slaiter
President



A PANOLIO CANYON



PLOMBO CONSTRUCTION COMPANY
CONTRACTORS ENGINEERS
CONSTRUCTION DIVISION



July 15, 1988

Department of the Army
San Francisco District Office, Corps of Engineers
211 Main Street
San Francisco, CA 94105-1905

RE: Draft Environmental Impact Statement for the Proposed
Expansion of the Ox Mountain Sanitary Landfill

Dear Sirs:

Piombo Construction Company operates a small crushing and screening plant for the production of rock, sand and gravel near Half Moon Bay, San Mateo County, CA. The site is located in the area known as Muff Canyon near Pilarcitos Creek; access is made along the north side of State Highway 92 just before the creek crossing.

The quarry site chiefly consists of decomposed granite and we do no blasting - the material is soft enough to be shattered by small cone and jaw crushers. The operation employs 8 seasonal full-time employees and one office person. We have operated the plant since 1981 and would like to continue well into the turn of the century. The quarry supplies needed road base and backfill materials to local business concerns and small commercial and residential developments within a 10-mile radius of the site. Large quantities of gravel and sand are sold to local (Half Moon Bay) merchants, nurserymen, truckers and construction contractors. This site also supplies a special bankfill sand for Pacific Gas and Electric Company. No other materials meet this P. G. & E. specification within the Greater 10-Bay Area counties; the closest source is in Santa Cruz County.

Piombo Construction Company urges the Corps of Engineers not to consider the re-zoning and use of Muff Canyon for the disposal of solid waste. Landfill activities would interfere with truck traffic on Highway 92, create excessive congestion within the boundaries of the quarry site and deplete a valuable commodity to local merchants.

Very truly yours,

PLOMBO CONSTRUCTION COMPANY

Richard G. Plombo, Jr.
Richard G. Plombo, Jr.
Vice President

RCP:sbl

July 15, 1988

Colonel Galen H. Yanagihara
District Engineer
U.S. Army Corps of Engineers
211 Main Street
San Francisco, California 94105-1905
Dear Colonel Yanagihara:

My name is Dennis Marsh. My wife and I own a small ranch in Digges Canyon, the proposed landfill site by Browning Ferris Industries (B.F.I.) currently under your consideration.

We would like to take this time to strongly protest this venture. My wife and I have a two year old son whom we have planned to raise in this peaceful setting. This canyon is one of the last truly unspoiled canyons on our Coastside. It is home not only to us, but a variety of wildlife. To name a few we regularly see are deer, cottontail rabbits, quail, raccoons, skunks, opossums, bobcats, rainbow trout, steelhead and the most impressive; a shy cougar. If B.F.I. is permitted to destroy this canyon in the way of a landfill project the home of these animals will be destroyed as well as our home.

12-1 We carefully chose this place as a safe and healthy environment to raise our son, and hoped to give him the opportunity to appreciate the natural landscape and wildlife in this canyon. We could not very well do this if the canyon becomes a garbage disposal site. We put every cent we had towards the purchase of this ranch, if B.F.I. is allowed to fill this canyon with garbage it would ruin the value of our property as no one wants to live next to a garbage dump. To sell would be impossible and we cannot start over again.

12-2 Besides our own personal interest in keeping the disposal site out of the canyon, there is the ecological side of destroying a natural habitat for the abundance of wildlife. The next canyon to the South-East of Los Trancos Canyon (the current disposal site) is Nuff Canyon. This canyon is currently a quarry operation that has already destroyed the natural habitat for wildlife. Therefore, the threat to the natural landscape and wildlife of a landfill in Nuff Canyon would be considerably less than that of Digges Canyon.

12-3 Another important point to consider is the fact that Digges Canyon has a year-round flow of water in its stream, where as, Nuff Canyon's water flow is seasonal. Before B.F.I. constructed the landfill in Los Trancos Canyon the water flow in its stream was also year-round.

Colonel Galen H. Yanagihara
July 15, 1988

Page 2


Currently there is only seasonal flow.

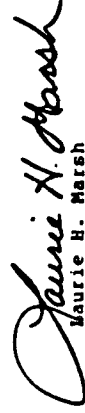
12-4 We also find it very hard to believe that there is ANY SAFE system to keep leachates from contaminating ground water and Apanolio Creek.

Please give this matter your most careful consideration, as there are alternative sites with much less detrimental effects on wildlife and private parties. Please don't let them destroy one of the few natural habitats left for wildlife because this will ultimately happen within a landfill site.

Thank you.

Sincerely,


Dennis M. Marsh
132 Digges Canyon Road
Half Moon Bay, California 94019
(415) 726-7743


Laurie H. Marsh

NAN SCOTT
1309 Lowell Avenue
South San Francisco
California 94080

July 15, 1988

Colonel Galen Yanagihara
District Engineer
U.S. Army Corps of Engineers
San Francisco, Ca.

Subject: Draft Environmental Impact Statement (DEIS)
Apenolio Canyon landfill expansion

Dear Col. Yanagihara:

I attended the hearing concerning the proposed expansion of the Ox Mountain Landfill on July 7, 1988 at the Supervisor's Chambers in Redwood City.

Of the 26 speakers, I was in the minority. I spoke in opposition to this "sanitary" landfill, pleading for the human beings who will be harmed by this project.

Unfortunately, most people don't realize what these 'sanitary' landfills contain.

A long time ago, when I was a child, I can recall the 'privy' we all used on my Grandmother's farm in Maryland. I can also recall lime being used in an attempt to minimize the effects of an open human waste pit. I recall the day when indoor plumbing was installed and how much more pleasant and healthy that was for our family.

Since that time we've made much progress in the treatment of human wastes. And, along with the modernization of sewage treatment we became a healthier bunch of people.

A hundred years ago parents of newborns tried not to become too attached to them because so many of them died in infancy from unsanitary conditions and diseases resulting from this.

I can recall, too, the large number of people--adults & children--who died and/or were crippled by polio... again attributed to contamination of water. A classmate died of polio after swimming in a lake which sewage was pumped into.

Today, we've become complacent--we no longer look on polio as a threat to life. Yet an article in the San Francisco Chronicle earlier this year reported on an outbreak of meningitis in the South Bay killing 4 people and affecting 9 others.

NAN SCOTT
1309 Lowell Avenue
South San Francisco
California 94080

Page 2

What we already know about the South Bay area is that the underground water is badly contaminated. In fact, the large number of malformed newborns in that area have also been linked to the underground water being contaminated.

I think this close-to-home example should be a warning to us all.

Many of the speakers at the hearing were county government people, city officials, supporters of the garbage industry... all obvious winners if this project goes through.

Many of them told you how this project had been anticipated for 25 years and it was about to happen. And there was the trotting out of speakers to try to convince you just how badly this canyon is needed for stashing our garbage.

No one among them is looking to the fact that things have changed in 25 years. A simple landfill situation 25 years ago didn't have to address the problem of human waste in landfill. There just weren't that many people throwing products away... those products weren't being mass produced and used. Certainly not disposable diapers.

But things have changed and advertising and PR have convinced people that it's better to throw things away than reuse them or fix them. Think about it: appliance repair people are almost non-existent. Manufacturers are quick to tell you it is cheaper to throw the malfunctioning appliance away and buy a new one. People are convinced of this and follow the suggestion to the point where we are being buried in our garbage; we're a throw-away society to our detriment.

And when you think about it, all this talk of the need for a place to stash trash, aren't we trying to solve the symptom of the problem rather than dealing with the real crisis... we cannot keep up our wasteful way of life without despoiling our beautiful land and affecting our own health.

We need to realize, too, that there are people who profit very handsomely from the throw-away craze. That includes the politicians who are able to brag to their constituents that they've solved the problem of where to bury our trash. The garbage people will be happy because they're making a bundle carrying things like disposable diapers, containment underpads, and contaminated hospital products to the landfill. Out of sight, out of mind, nice pay checks.

The garbage men are at risk from handling this material but they don't want to think about that. They have blinders on... like

NAN SCOTT
1369 Lowell Avenue
South San Francisco
California 94080

Page 3

the HMB garbage man who preceded me out of the hearing room and made light of the human waste in landfill. When I challenged him he shrugged his shoulders and said "What are we going to do" indicating there was no alternative to paper diapers. There is a reusable alternative which is much cheaper, safer, healthier since the waste in reusable diapers is treated in our sewer treatment system, I told him.

The third group includes the industry giants like Proctor and Gamble who developed and manufacture disposable baby diapers, disposable adult diapers, disposable underpads. Disposable diapers for children account for about 85% of the total diapering. And they are now heavily promoting their adult line which they call Attends. Are you aware there are between 8 and 12 million people in the United States who are incontinent . . . do you realize where these numbers can take us in terms of finding places on this planet to bury human waste . . . when, in fact, people should be wearing reusable garments which can be safely processed.

Proctor & Gamble has never had a more profitable product--use it once and throw it away. And, may I remind you, they pay none of the cost of disposal of their profitable products. "Disposable diapers" . . . think of it . . . what a misnomer!

The problem of where to bury our wastes has gotten so critical that some states, already out of landfill, are sending their wastes out on barges to roam the oceans for a place to dump. Last week vials of AIDS contaminated blood were sloshing about on Long Island Sound. And this will get worse.

I recall the statement of one of the proponents of filling that canyon with waste. He very glibly stated "Corrective action will be taken if "something" contaminates the ground water."

But who is addressing what the effect of that contamination will be on humans? And, how long will it be before they find the contamination? And how will they rectify it???

If human waste is to be a part of landfill (as it now is) then it must be treated to make sure things like the active polio virus and hepatitis vectors are dead before they percolate down into the underground water supply.

At the end of my statement on July 7, I entered some information into the record for your perusal. I am enclosing more related material for you. All of this relates to a very real problem. I hope you will look it over carefully and give this threat to human beings considerable attention in your deliberations. We are all vulnerable . . . so vulnerable from things we aren't informed about and don't expect to damage us.

NAN SCOTT
1369 Lowell Avenue
South San Francisco
California 94080

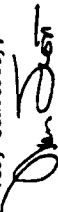
Page 4

You have a very heavy responsibility. In spite of the perceived urgency of the 'Yeah! group of speakers to get your approval for another canyon to be filled with wastes, I do hope you will address the safety of the population and keep that uppermost in your mind.

We will probably always need 'landfill' but we don't need to and shouldn't contaminate our planet with human waste which should properly be treated as a sewage problem instead of a simple 'sanitary' landfill burial problem.

If we're to remain a healthy race we're going to have to make changes. We cannot continue our wanton ways. We must recycle and show concern for humans as well as steelhead trout, butterflies. We have got to face the problem and solve it, not just keep trying to bury it.

Very sincerely,



Nan Scott

Home address: 451 California Avenue
Moss Beach, Ca. 94038

Office phone: 415 588 4558

Home phone: 415 728 7774



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southwest Region
300 South Ferry Street
Terminal Island, California 90731

July 12, 1988 F/SWR33:TDW

Colonel Galen M. Yanagihara
District Engineer
San Francisco District
Corps of Engineers
211 Main Street
San Francisco, California 94105

Dear Colonel Yanagihara:

We reviewed the Draft Environmental Impact Statement (DEIS) for the proposed Ox Mountain Sanitary Landfill, Apanolio Canyon Expansion Site, in San Mateo County, California. The DEIS describes a proposal to place fill in association with developing a sanitary landfill in Apanolio Canyon, adjacent to the existing Corinda Los Trancos Canyon landfill. The following comments reflect the views of this agency.

The National Marine Fisheries Service (NMFS) is responsible for preserving and enhancing marine, estuarine, and anadromous fish resources and the habitats that support these resources. As documented in earlier correspondence, in this instance, we are particularly concerned with steelhead trout resources. Coastal streams such as Apanolio Creek which support these resources or have the potential to be restored to such use, are of significant importance; there remain only a few such coastal streams supporting remnant steelhead runs.

ALTERNATIVES

In our letter dated May 4, 1987 (DEIS, Appendix A), we stated that a thorough examination of alternatives to the proposed landfill was necessary, and that eliminating a viable steelhead run for the construction of a non-water dependent landfill was unacceptable. We believe there may be alternatives, or a combination of alternatives, that could address the refuse disposal problem without impacting these steelhead resources.

The alternative analysis presented in the DEIS, however, is inadequate. What is presented serves more as a justification for the preferred alternative than a thorough examination of options to the proposed landfill. We are not convinced that out-of-county disposal possibilities are beyond consideration. While there is obviously some "red tape" required with such an option, the likelihood of such an undertaking is not thoroughly examined.



We recommend that the final EIS further explore life costs of the out-of-county sites identified, and compare them with the cost of the preferred alternative. Capacity analyses of the out-of-county sites should be considered in that assessment process. We suggest the County work directly with the other waste management companies to realistically evaluate these alternatives.

In addition, we believe that the "required" capacity of the preferred alternative may be overstated; other efforts could increase efficiency and reduce the capacity needed by the County. Various means of recycling could be implemented, greatly reducing the size of a landfill needed. Such options should be thoroughly examined and presented in the final EIS.

The DEIS discusses a "contingency plan" to be implemented should the leachate control system fail to contain contaminants and therefore, fail to prevent groundwater and surface water contamination. The plan does not address remedial action to be taken to benefit fish and wildlife resources impacted by such a failure.

In its description of the "no action" alternative, the DEIS describes a series of events that should be examined regardless of which alternative is chosen. The County should explore out-of-county disposal thoroughly, should examine all possible in-county sites currently not identified, and should "...accelerate development and implementation of resource recovery to reduce the volume of solid waste requiring landfill disposal."

FISH RESOURCES

With respect to the information presented in the DEIS regarding fishery resources, the issue of whether or not the fish found at the project site are definitely steelhead trout and not "residualized rainbow trout" is not of critical importance. The project site contains significant and rare habitat for both, with high restoration potential for steelhead. The DEIS does not supply all available information regarding the steelhead trout fishery within the proposed project site.

After extensive consultation with biologists from the California Department of Fish and Game (CDFG), and the U.S. Fish and Wildlife Service (USFWS), we find that sufficient information exists to substantiate the existence of steelhead trout within the proposed landfill site and warrants further monitoring. Much of the literature clearly indicates that resident rainbow trout and winter-run steelhead trout may co-exist in a given stream, without hybridization (Shapovalov and Taft, 1954; Rounsefell, 1958; Behnke, 1984). During hi-flow winter conditions, steelhead trout should be physically able to negotiate passage over the downstream barriers. To determine passage probability based solely on low-flow summer and drought year conditions (as

presented in the DEIS) may seriously misrepresent the fisheries. All available information regarding the steelhead trout resources of this basin should be presented in the final EIS.

MITIGATION

Our review of the proposed mitigation plan (DEIS, Appendix B) reveals that it does not fully take into account the impacts of the preferred alternative. This alternative projects the filling of 20 percent of the Apanolio Creek watershed, a 40 percent decrease in summer flows (and therefore increased sedimentation) and the permanent loss of 4,795 linear-feet of riparian and fishery habitat, including pools and riffles. The proposed mitigation does not compensate for these losses in-kind. When mitigation is a consideration, the NMFS recommends in-kind, on-site, acre-for-acre replacement, with no net loss of habitat or habitat values.

In addition, we question criteria used to establish habitat values. These criteria appear to assign values arbitrarily, using a system that is not widely accepted. The final EIS should explain how the criteria are derived and then explain how the criteria sort given resource values. A more widely-known and accepted methodology would be preferred, as it is not clear what the values in the DEIS represent.

Overall, we find the mitigation plan provides a piecemeal approach to compensate for project impacts. The landfill proposal impacts an entire, self-contained and very unique ecosystem. Mitigation should fully replace such losses when impacts are determined to be unavoidable. The proposed mitigation does not provide any replacement for the loss of nearly 5,000 linear feet of instream habitat, which is critical to steelhead trout.

The mitigation includes replanting some areas for stabilization, which would may be necessary for the integrity of the landfill but perhaps should not be considered mitigation. The same can be said for the creation of sediment ponds and re-vegetation of their perimeters.

We also question the construction of 25 weirs along the undisturbed section of Apanolio Creek. No data are presented in the DEIS to justify the placement of these weirs. The CDFG (Personal communication) has indicated concern, which we share, with the various hydraulic and hydrologic conditions of the stream. Flow calculations and sediment transport information should be gathered prior to designing such structures. The DEIS should address the impacts resulting from placing these weirs, including the removal of riparian vegetation, and how these impacts would be mitigated.

14-12 We are also concerned that modifying stream barriers may not be necessary. In hi-flow winter conditions, fish can negotiate passage of these barriers. Modifying these barriers may not constitute actual mitigation, and may prove to be an unnecessary disturbance.

14-13 The DEIS suggests that placing deflectors in a culvert in San Pedro Creek watershed will increase summer low flows, thus benefiting fish. Increasing summer low flows may not increase habitat values. With respect to the proposed prescribed burns; again, we do not view this as mitigation, as lost habitat values or acres are not replaced. Burns may be necessary for landfill management and should be described as such. Finally, these mitigation proposals are not within the stream basin and do not replace on-site values lost.

In conclusion, we find the DEIS to be deficient in a number of areas. The information lacking in this document should be provided in the final EIS. Other viable options to the Apanolio Canyon location site may exist, especially out-of-county. We encourage the County to fully explore all such options. All available information regarding fish resources of the project site should be disclosed. Finally, we recommend that any mitigation plan designed for the project explicitly address the impacts to be offset.

Sincerely,

E.C. Robertson
Regional Director

cc: FWS, J. McKeivitt
CDFG, D. Lollock, L. Ulmer
EPA, T. Yocom, Rick Hoffman
CRWQCB, Ken Theisen

Literature Cited

- Behnke, R.J., 1984. About Trout. Trout Mag. Winter 1984. pp. 43-48.
- Rounsefell, George A., 1962. Relationships among North American Salmonidae. U.S. Fish and Wildlife Serv. Fish. Bulletin #209, Volume 62. pp. 235-270.
- Shapovalov, Leo and Alan C. Taft, 1954. The life histories of the steelhead rainbow trout (*Salmo gairdneri gairdneri*) and silver salmon (*Oncorhynchus kisutch*) with special ref. to Waddell Creek, Calif. and recommendations regarding their management. Calif. Dept. of Fish and Game Fish. Bull. #98, 375 pp.

252 Madrone Avenue
Pescadero, CA 94060
July 9, 1988

Colonel Galen H. Yanagihara
District Engineer
U.S. Army Corps of Engineers
211 Main Street
San Francisco, CA 94105-1905

Re: Draft Environmental Impact Statement
Ox Mountain Sanitary Landfill
Apanolio Canyon Expansion Site
San Mateo County

Dear Colonel Yanagihara:

I attended the July 7, 1988 hearing at the San Mateo County Board of Supervisors Chambers for the above referenced proposal. I am a San Mateo County coastside resident and I am interested in preserving our creek habitats and the native steelhead and salmon populations. I did not speak at that meeting but I would like to offer some comments regarding the E.I.S. and some of the statements made during that hearing.

15-1 [- I would agree that BFI does a good job in its business of waste disposal. I don't see how that is relevant to whether or not Apanolio Canyon is an appropriate site for the sanitary landfill expansion.

15-2 [- I don't believe that there was adequate study given to the determination that migrating steelhead or salmon do not use Apanolio Creek. No reference was made to speaking to local farmers and ranchers who would have historical knowledge of this question. Additionally, what is the State Department of Fish and Game's position on this question?

15-3 [- A statement was made by one of our county supervisors that the recommended site is likely to be developed if not used for the landfill. Is this true considering our strict land use regulations for agricultural land in San Mateo County, and even if it is, how is that relevant to the appropriateness of the site for the landfill expansion.

15-4 [- Statements were made that there would be little or no impact on Highway 92 traffic patterns due to the proposed expansion. That is simply untrue. I invite you to experience the commute on Highway 92 and examine the current impact of BFI trucks on this increasingly crowded, slow and dangerous thoroughfare. Don't take my word for it. See for yourself or survey some of the other thousands of daily users.

15-5 [- It is true and deplorable that some of our citizens and visitors

[dump their trash on the sides of our roadways. That fact in no way validates the Apanolio Creek Canyon as the best site for the expansion project.

15-6 [- I believe that there were statements made to deliberately confuse the current landfill site with the proposed adjacent site, with respect to the "25 years of support and preference".

15-7 [- I don't believe that it is clear that the joint mining and waste disposal use of Nuff Canyon is incompatible. It would seem that these joint uses could be complementary and that this alternative deserves much deeper investigation.

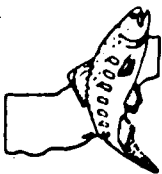
15-8 [Last Thursday, you heard largely from county politicians, ex-politicians, county officials, business people and consultants, not from the Coastside, but from "over-the-hill". Many of their statements were rationalizations, emotional appeals and not relevant to whether or not the proposed site is the best one for the landfill expansion. They were not speaking for the interests of Coastside residents or for those committed to preserving our steelhead and salmon habitat in San Mateo County. They just want a place to put their garbage. No one spoke for the Half Moon Bay City Council; what is their view with respect to this E.I.S. and its implications?

[I urge you to require further investigation of alternative sites so that the unique Apanolio Canyon watershed and habitat can be preserved. I appreciate the opportunity to make these comments to you.

Sincerely,

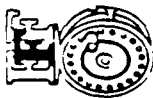
Tom Reynolds

James H. Reynolds



Northern California Council Federation of Fly Fishers

2215 EATON AVENUE, SAN CARLOS, CALIFORNIA 94070



July 9, 1988

Col. Galen H. Yanagihara
U.S. Army Corps of Engineers
Department of the Army
San Francisco District
211 Main Street
San Francisco, CA 94105-1905

re: Application No. 16611591; DEIS for the Ox Mountain
Sanitary Landfill, Apanolio Canyon Expansion Site. Browning
Ferris Industries.

Dear Col. Yanagihara:

We have reviewed the referenced document, familiarized ourselves with the land in question, and have talked with residents in the area as well as wildlife professionals about the project. The Northern California Council, Federation of Flyfishers (NCCFF) is comprised of thirty-four member clubs in northern California and Nevada, including ten angling clubs in the San Francisco Bay Area. Our members are pledged to seek reversal of the State's declining fish populations, including the restoration and enhancement of the steelhead rainbow trout. We are, therefore, very concerned about the proposal to bury a life giving stream under 123.7 million cubic yards of refuse.

Since the granting of a Section 404 permit depends to some extent on the reasonableness of viable alternative actions, we are disappointed by the incompleteness of the alternatives discussed, as well as their evaluations.

Contrary to what our elected officials have stated, the alternative to the proposed plan is not the elimination of all landfills. The County and BFI can arrange an interim agreement with Alameda County (Altamont) while lower impact sites are developed.

Resource recovery was promised to San Mateo County residents when the County Supervisors first approved the Ox Mountain Landfill site, and again in their 1983 Solid Waste Management Plan. Now with the present "crisis", supervisors are once again giving lip service to re-cycling.

We recognize BFI as a responsible and conscientious operator, and have little doubt that they will comply with the terms and conditions of their permits. The issue, however, is not the operating standards of BFI, but the permanent destruction of scarce and irreplaceable habitat.

A Regional Council of the Federation of Fly Fishermen

We also recognize that engineering failures (liner failure, plugging of culvert, escape of contaminated leachate) can occur even with diligent compliance with specifications. Comparing long term risks with short term convenience and efficiency should lead to the preference of other sites.

It seems evident that impacts to the fishery are understated in the DEIS. Pilarcitos Creek and all of its other tributaries provide minimal rearing habitat for young salmonids due to over appropriation and other forms of degradation. Providing access for spawning steelhead to watersheds that are dewatered by August is not mitigation. Streamflow data and observations indicate that without the high quality habitat afforded by Apanolio Creek, the remaining Pilarcitos watershed cannot maintain a steelhead population.

We feel that the judgments made regarding the loss of fisheries and compensating measures could not have been made with the available data. A comprehensive fishery study, including an IFIM (Instream Flow Incremental Methodology) study, and cumulative analysis of the impacts to the fish, their habitat, and their food sources (invertebrate populations) should be completed before a Section 404 permit is granted.

Wildlife professionals have serious disagreements over whether or not the fish in Apanolio Canyon are anadromous or "residualized" steelhead. It would be absurd, however, to destroy Apanolio because a structure may be preventing steelhead from passing in all but high water years. It would make far more sense to modify the structure and let the creek continue to produce.

The mitigation plan prepared for BFI by Ralph Osterling Consultants, Inc. indicates that the proposed landfill is unmitigatable. The compensation the plan offers is either inadequate, unworkable, or could and should be achieved by other agencies. We will restrict our comments on the mitigation plan to fishery values:

Habitat Loss: Without more compelling evidence, we cannot accept the stated figure of 3,676 feet of coldwater (salmonid) habitat loss, not that the reach is inaccessible to Steelhead. DFG district biologists measured the instream habitat loss at 5,813 linear feet, and determined that the salmonids found in the electroshocking survey were probably juvenile steelhead, with the possibility that some residualized trout were also part of the sample (Ulmer - personal communication).

16-9

Pilarcitos Creek Watershed: The effectiveness of the streambank revegetation plan and cattle enclosure will depend on water quality and quantity. The mitigation plan does not indicate how water quality and quantity will be monitored and maintained.

We do not believe that the fish barrier modification at the Hwy 92 crossing can be considered as mitigation for the landfill project. Although barrier modification should be implemented, this is the responsibility of Caltrans and cannot be used to offset the losses on Apanolio Creek. The DEIS fails to state that during most years steelhead are able to pass the Hwy 92 crossing, and that steelhead production in the reach is not limited by lack of spawning, but by lack of rearing habitat. Productivity in Pilarcitos Creek cannot be enhanced unless adequate high quality flows are provided. We suggest that BFI approach the operators of Stone Dam to discuss adequate bypass flows to restore Pilarcitos Creek.

16-10

Apanolio Creek Watershed: As in the Pilarcitos Creek Watershed, barrier modification can be achieved without the assistance of the project proponent, and steelhead are apparently passing the structures in at least some years. Weight should be given not only to existing fishery conditions, but with the readily achieved potential of Apanolio Creek in the project reach.

Instream structures can provide suitable habitat for salmonids if sufficient flow and gradient are available. The mitigation plan does not provide sufficient evidence that the proper hydrologic conditions exist for the 25 proposed weirs to function properly.

16-11

Arroyo Leon Watershed: Steelhead consistently pass the culvert on Arroyo Leon Creek. Passing more steelhead on a stream that is dewatered every year is not enhancement. The purchase of water rights to maintain summer flows in the creek, with monitoring to enforce those flows, would be a much more meaningful contribution to fishery productivity.

16-12

San Pedro Creek Watershed: The successful restoration of San Pedro Creek has been an ongoing project of interested citizens in the Pacifica area and the San Mateo County Parks department. Steelhead are, at times, given human assistance to ascend past the structure that is targeted for modification. We would like to see this structure modified, but not as a trade-off for the destruction of Apanolio Creek.

16-13

For the aforementioned reasons, we find the mitigation (compensation) plan inadequate. An acceptable plan would have to deal with streamflow issues to maintain rearing habitat during summer low flow periods. BFI's consultant should work with the USFWS as well as the DF&G District Biologist to formulate more meaningful compensation measures.

16-14

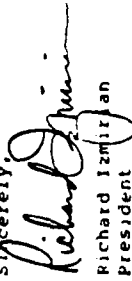
Millions of dollars have been allocated by the State and Federal governments to restore the anadromous fisheries of the State in compliance with public policy. None of these funds have been spent in San Mateo County and none have been applied for. There is no agency or commission within San Mateo County to identify and plan such restoration projects. The same Board of Supervisors that approved siting a landfill in Apanolio Canyon has failed to heed requests by concerned citizens for a fish and wildlife commission such as are utilized by other counties in the State. The Corps of Engineers should not let its public trust responsibilities be overruled by bad local government decisions, no matter how unpleasant the political task of re-siting a landfill.

16-15

Finally, we are extremely concerned about the precedent that would be set by granting a Section 404 permit for a project that would eliminate a steelhead stream for a landfill. This is an improper and unreasonable use of the State's water resources, impacting the beneficial use of the water in Apanolio Creek and in the Pilarcitos Creek watershed.

Thank you for the opportunity to comment on the DEIS.

Sincerely,


Richard Izmirian
President

July 8, 1988

Colonel Galen Vanagihara
Corps of Engineers
Department of the Army
San Francisco District
211 Main St.
San Francisco, CA 94105-1905

Re: Public Notice #16611591; Draft Environmental Impact Statement; On Mountain Sanitary Landfill, Apanolio Canyon Expansion Site; Apanolio Creek, San Mateo County; Comments by Thomas G. Kilfoil.

Dear Colonel Vanagihara:

As a concerned citizen with residence in Burlingame, CA and business in San Bruno, CA I wish to make the following observations and comments concerning the draft EIS and the proposed project:

Although I am a sportsman, who loves to fish, and am concerned about the effects this new proposed site will have on the fishery downstream, my main concern is water quality, now and in the future. The decision you make regarding this project and the effects it will have on future surface and especially ground water in the area, is one we will have to live with for a long time to come.

One of the areas I would like to address deals with the leachate created at the dump site. How it is handled and possibly should be handled. How it is affecting the present ground water quality downstream from the present dump site.

Another area is that of the sewer sludge that Half Moon Bay is presently dumping in Corinda Los Trancos Canyon and plans to dump at any new dump site that approval is granted to BFI. How much are they dumping, now and planning on in the future? If it is allowed to continue, when is it going to conform to State standards of 50% solids?

The Report by Calif. Regional Quality Control Board, SF Bay Region, April 22, 1987, File #2179.7053, Page 2, Item #7, talks about the water still flowing under the refuse in Corinda Los Trancos, as well as the leachate created by the refuse. It indicates that "The leachate is separated from the ground water collection system by a construction barrier. However, ground water monitoring data indicates that leachate may be leaving the site."

For the Regional Quality Control Board to make these comments there had to have been an adverse change in the chemical properties of the water. Those results should have been spelled out in the draft EIS as well as the current chemical make-up of the water to show the impact on ground water in Corinda Los Trancos Canyon, which is next to Apanolio Canyon. Similar results more than likely will occur in the new proposed site.

PAGE 2

17-4

Since Corinda Los Trancos Canyon supplies at best, 3-4% of the watershed to Pilarcitos Creek Watershed, it makes you wonder what will be the same impact from Apanolio Canyon which supplies at least 8%, or double the flow to the watershed, if the permit is approved and BFI is permitted to start dumping garbage in that area.

17-5

It has come to my attention that BFI has developed some springs above the valley floor in Corinda Los Trancos Canyon in order to supply their caretakers home with water. I don't know the relative position of the springs to the dump sight, but this water source was developed to replace a well that went bad for some reason. I don't know if it caved in, went dry, or the water went bad, but I feel that all the particulars for this change should be enumerated in the EIS. A test of the present water composition from the old well sight should be made by the Water Quality Control Board or some other impartial group and listed in the EIS, along with original well water tests when the dump site first opened, to show what type of changes have occurred just over the short life of the present dump site. This comparison will show what type of impact to expect downstream from the proposed dump site.

17-6

These results will have a direct bearing on what Mr. Gil Gossett, who owns the property directly below the proposed dump site in Apanolio Canyon, as well as any other well owners further downstream, can expect from their wells, if the project is permitted to commence. What effects will occur 25, 50 or even 100 years from now is anyone's guess. What sorts of mitigations are planned to handle the ground water should it become contaminated by the proposed dump site? These should be spelled out in the EIS.

17-7

It is my understanding that BFI's dump site in Corinda Los Trancos Canyon at present is in violation of the California Code of Regulations, Title 23, Sub-chapter 15, Section 2530C which requires a minimum 5 foot separation between the waste and the highest anticipated elevation of the underlying ground water.

I believe that BFI as applied for an EXCEPTION to this regulation for the Apanolio Canyon site, which means that they plan to have the starting layer of waste closer than 5 feet to the highest level anticipated of the ground water. More than likely it will be closer to 3 feet. This exception is requested for an area that gets at least twice the water as Corinda Los Trancos. It doesn't make sense.

The regulation was set at a minimum of 5 feet for a good reason. It was a compromise level agreed upon that would afford protection of the ground water should heavy storms hit the particular area. In this case BFI wants to get around that requirement by stating that their new technology will more than make up for the 5 foot requirement. I question whether the proposed lining to be used to contain the leachate will last, since the experience throughout the US has shown that the linings within the fill sites eventually fail. What does BFI intend to do should this happen? Mitigations for this contingency should be spelled out. Are they prepared to post a bond to cover the costs of repair should the linings fail?

17-8

To further exacerbate the above violation at Corinda Los Trancos Canyon, it has come to light that SAM, which stands for Sewer Authority Mid-Coastside that handles the Half Moon Bay Sewage Treatment facility has been dumping sewage sludge into this canyon that doesn't meet new state standards. At a recent S.A.M. Board Meeting held on or about June 27, 1988 comments made by Bill Heaslet, General Manager of S.A.M. were reported somewhat as follows: "...And the land fill "could cut us off at anytime" because SAM's sludge, with a paltry 20% solids, does not come near meeting new state standards of 50% solids. The "land fill" Mr. Heaslet referred to is the BFI site in Corinda Los Trancos Canyon.

I asked Mr. Lino Valbusa, the District Manager of BFI Waste Systems if they planned to dump any sewage sludge in these dump sites. He answered with an emphatic "NO, we won't take anybody's sewer sludge, but we have taken a few loads from Half Moon Bay." This comment was made to me on the night of the hearing in Redwood City, July 7, 1988, while I was speaking with Mr. Gil Gossett as well as Mr. Don Slaiter in the lobby.

In the Half Moon Bay Review, Wednesday, July 6, 1988 an article appeared that is very upsetting and is pertinent to the future health and safety to the people in the Pilarcitos Creek Watershed located in the Half Moon Bay area. It mentions the planned expansion of the present sewage treatment plant to a capacity of 3.72 million gallons per day. This from the present 2 million GPD with the possibility of going to 4 million GPD in order to handle the excess Ooze from Ox Mountain. This Ooze they speak of is the leachate that is collected at the dump site from the decomposing garbage. 80,000 gallons per day capacity is being held aside in the planned expansion for the leachate created from the present and planned dump sites on Ox Mountain. The report says that at the recent SAM meeting it was mentioned that if "they" did not take the sewer sludge it would cost more than the \$44,000 per year present allocation to get rid of it. "They" refers to BFI as Half Moon Bay is taking it's sewer sludge presently to Ox Mountain.

It seems that the few loads of sewer sludge referred to by Mr. Valbusa of BFI on the night of July 7th as noted earlier are either very expensive per load for Half Moon Bay or there's a lot more sewer sludge going to the dumpsite than we are led to believe. The actual quantity dumped over the present life of the dumpsite at Corinda Los Trancos should be spelled out in detail in the LIS. This will show what minimum amount could be expected to be dumped in Apunolito Canyon should the project be allowed to commence. From the future expansion planned for the treatment plant, the past quantities of sewer sludge should be almost doubled for a more realistic figure of what to expect. Also is the future sewer sludge going to meet state requirements? Frankly if it doesn't, it should not be allowed near the dump. It would be better if it was put in some other dry canyon, rather than in one of the wettest ones in the whole area.

17-9

According to Solid Waste Management Group, a subsection of the EPA in Washington, D.C. it is suggested that all leachate from dumpsites be recycled thru a municipal sewage treatment plant before being recycled onto the dump site, or dumped in any other location. What has BFI been doing with their present leachate at Corinda Los Trancos? I've been led to believe that they are recycling it directly onto the present dumpsite as dust control. BFI is putting the leachate right on top where any large rainstorm can take it downstream in it's run off. I feel it is definitely wrong to use this leachate solution before being recycled thru the sewage treatment plant. If the leachate is being directly recycled, it is creating a time bomb, that will slowly but surely let contaminants get into the water supply.

17-10

It is the duty of the U.S. Army Corp. of Engineers to see that everything possible is done to keep our water clean and as safe as possible now and in the future for us as well as our children. I can sympathize with all the various cities within the county that need a larger dump site. But, during the last 25 years they sure haven't tried to find viable alternate sites. The alternate sites proposed by BFI frankly look like "straw men" that can easily be knocked aside. Apunolito Canyon is the easy way out, but how much concern has been shown to protect the present and future water supply? Not much that I can tell from the current EIS.

17-11

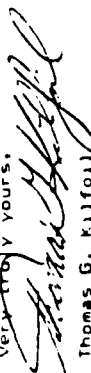
What sort of mitigation has been planned in case the water supply does become contaminated? What plans are being made if the water supply becomes too little due to the expected 40% drop through the dump site? Will additional water be brought in to protect downstream water rights as well as minimum flow requirements to protect the steelhead and trout fishery? All these questions should be answered in the final EIS in detail.

17-12

Why hasn't the possibility of having the garbage incinerated at the proposed site in Redwood City been looked at in more detail? It's obvious why BFI doesn't bring it up. They won't own it or get any benefit from San Mateo County if the county decided to go that way. As long as an easy way out is provided, good, long range projects like the proposed incinerator will be put aside.

Thank you for letting me bring up a few questions that I feel should be answered before a final decision on the permit is made.

Very truly yours,



Thomas G. Kilfoil

Thomas G. Kilfoil
40 Howland Hill Lane
Burlingame, CA 94010



COUNTY OF SAN MATEO

COUNTY GOVERNMENT CENTER • REDWOOD CITY • CALIFORNIA 94063 (415) 363-4123

BOARD OF SUPERVISORS

ANNA C. ESKOO
MARY GRIFIN
TOM HUENING
TOM NOLAN
WILLIAM J. SCHUMACHER

David L. Nichols
COUNTY MANAGER
(415) 363-4123

July 7, 1988

Colonel Galen H. Yanagihara
District Engineer
U.S. Army Corps of Engineers
211 Main Street
San Francisco, CA 94105-1905

Dear Colonel Yanagihara:

RE: COMMENTS ON DRAFT ENVIRONMENTAL IMPACT STATEMENT
OX MOUNTAIN SANITARY LANDFILL, APANOLIO CANYON EXPANSION
SITE (REGULATORY PERMIT APPLICATION NO. 16611S91)

San Mateo County has reviewed the Draft EIS and is pleased to submit to you the following comments:

- o The Draft EIS validates the original work performed in 1984 by Thomas Reid Associates through the local CEQA process. The EIR information has been updated and authenticated by the EIS and adequately evaluates all practical alternatives to the proposed project.
- o We regret that we cannot find a site within San Mateo County which would eliminate all environmental impacts. However, faced with the overwhelming reality that a County of 600,000 people produces a significant amount of solid waste which must be disposed, we believe Apanolio Canyon provides a location which minimizes impacts to the community at large.
- o We support all reasonable efforts to mitigate the impacts which have been identified and if the review process results in additional suggestions we would support feasible measures that result in measurable alleviations of impact.

Colonel Galen H. Yanagihara
District Engineer
U.S. Army Corps of Engineers
Re: Comments on Draft Environmental Impact Statement
OX Mountain Sanitary Landfill, Apanolio Canyon Expansion
Site (Regulatory Permit Application No. 16611S91)
July 7, 1988

Page 2

- o The County has expended substantial time and effort investigating out-of-county alternatives to accept our solid waste. These efforts centered on landfills in Alameda and Santa Clara Counties and have been unsuccessful. Alameda County has indicated that they would have to have 50 years capacity under permit before they would consider accepting any of our waste, which is a capacity they do not currently have. Also given the number of years it took San Francisco to negotiate room for their garbage at Alameda, I do not see how we could reach an agreement before the closure of Corinda Los Trancos. In Santa Clara County, the only two landfills which could be available are within the jurisdiction of the City of San Jose which currently has a ban on the acceptance of imported garbage. While these constraints are political and legal to some degree they nevertheless represent real constraints which indicate that the County is best served by providing a site for its own waste disposal.
- o Regarding the Nuff Canyon alternative, we do not support the simultaneous operation of a rock quarry and landfill. Anyone familiar with the history of the Pilarcitos Quarry would realize the hazards involved in such an alternative. The San Mateo County Planning Commission has held approximately ten (10) workshops and hearings on the regulation of truck traffic in and out of Nuff Canyon. Numerous complaints from commuters have been lodged with the County and the City of Half Moon Bay regarding the existing dangers of loaded quarry trucks on Highway 92 exiting from Nuff Canyon. To consider adding trucks loaded with solid waste at that location is totally unacceptable and would create a public safety problem. Currently, no problem exists at Corinda Los Trancos and Apanolio Canyon would continue using the existing methods of access to that site.
- o The County and its various cities recognize the importance of recycling in solid waste management. Recycling programs are currently underway or in the final stages of preparation throughout the County. A Recycling Task Force, created by the Board of Supervisors, has been

Colonel Galen H. Yanagihara
District Engineer
U.S. Army Corps of Engineers
Re: Comments on Draft Environmental Impact Statement
Ox Mountain Sanitary Landfill, Apanolio Canyon Expansion
Site (Regulatory Permit Application No. 16611S91)
July 7, 1988

Page 3

engaged in projects to educate the people of San Mateo County about the benefits of recycling and to encourage citizen participation. A recently completed survey of recycling in San Mateo County found that the current level of recycling in the County is 23.4 percent of the waste stream. Even with an increase in recycling to 35 percent (the goal to be contained in the 1988 revision of the County Solid Waste Management Plan) over 660,000 tons per year of solid waste generated in San Mateo County will need to be disposed of.

o We are pleased to attach to our comments the results of over 10,000 trap days of data searching for the presence of the San Francisco Garter Snake (SFGS). The data represents traps at Corinda Los Trancos Canyon, the project site, and Apanolio Canyon and portions of the Pilarcitos Watershed. No San Francisco Garter Snakes were found in these areas. This survey represented the most significant survey for SFGS ever conducted in the Pilarcitos Watershed.

o Finally, it is significant to note that the Apanolio Canyon landfill is not an isolated development but part of a process in San Mateo County which dates back to the early 1960's. At that time, recognizing its solid waste planning responsibility, the County hired consultants to study potential landfill sites to meet the long range needs of the County. That study and subsequent County planning actions led to the designation of the entire Ox Mountain Ranch as the solid waste facility for San Mateo County.

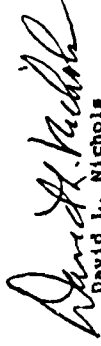
The first part of the ranch to be used as a landfill was Corinda Los Trancos with expansion into Apanolio Canyon. After the closure of these sites Frenchman's Creek and Locks Canyon may be considered for use. Nuff Canyon may be considered as well once that regionally significant rock resource has ceased operation. Thus there is a rational progression of use of these canyons planned for the reception of solid waste.

Colonel Galen H. Yanagihara
District Engineer
U.S. Army Corps of Engineers
Re: Comments on Draft Environmental Impact Statement
Ox Mountain Sanitary Landfill, Apanolio Canyon Expansion
Site (Regulatory Permit Application No. 16611S91)
July 7, 1988

Page 4

Within this context of comprehensive solid waste management Apanolio Canyon is the next site anticipated for use. Work towards its opening has progressed steadily and in full compliance with the regulations of the various governing agencies who have approved the project thus far. We believe that the Corps should keep the foregoing in mind as it considers its approval of the Apanolio Canyon Landfill.

Sincerely yours,


David L. Nichols
County Manager

DLN:WP:DFW:ddl

Attachment: SFGS Final Report
by Dr. Samuel M. McGinnis

512 Fourth Street
P.O. Box 634
Montara, California 94037
July 10, 1988

Colonel Galen H. Yanagihara
District Engineer
San Francisco District, Corps of Engineers
211 Main Street
San Francisco, California 94105-1905

Dear Colonel Yanagihara:

This is in response to your request of May 27, 1988 for comments on the proposed expansion of the OX Mountain Sanitary Landfill in San Mateo County, California (Regulatory Permit Application No. 1661591). As an elected member of the Montara Sanitary District Board of Directors I am very much aware of the necessity for a solid waste disposal facility and the critical space problems at OX Mountain.

From the analysis presented in the environmental statement on the proposed expansion of OX Mountain it appears that the preferred alternative would be the most economical. The favorable economic forecast appears to be the result of its projected life of 93 years. However, I fear that this projected capacity with the low disposal cost of approximately \$1 per cubic yard will lull the San Mateo Board of Supervisors into complacency with regard to recycling programs. While the Board has been very supportive of and are encouraging voluntary recycling programs, they have rejected and, I understand, have testified against any form of mandatory recycling at hearings of the State Assembly.

The voluntary programs grab the headlines but do not begin to make a dent in the mountain of trash we dispose of weekly. Regardless of the life expectancy of our landfill, if we are to manage our waste efficiently, we must have mandatory requirements to recycle at a minimum our newspapers, bottles and cans. In addition to prolonging the life of the landfill such a program can be financially rewarding. I know of an east coast county with a population and area about the same as San Mateo which reported that its mandatory program for separating newspapers from the curbside trash pick-up netted BFI, its contractor too, better than \$200,000 last year. As mitigation for disrupting a valued water course and destroying yet another relatively undisturbed valley BFI should be willing to explore the establishment of a similar program to be implemented within five years of the opening of the expanded OX Mountain facility with the counties and communities that use the facility. I am requesting that you require as a

19-1

permit condition for the proposed undertaking that within five years of opening the expanded landfill BFI will refuse to accept waste from any community or county that does not have a mandatory recycling program.

It appears that the major expense in developing the proposed landfill will be the cost of building the systems designed to separate storm runoff, ground water and leachate. Your draft environmental statement (DEIS) notes the fact that the preferred alternative is in an area of frequent seismic activity and that steps "could" be taken to keep the leachate from reaching the ground water or the creek should a failure occur. What assurance do we have that these steps will be taken? Furthermore, will failures be recognizable before the ground water or creek are contaminated?

19-2

19-3

It is stated in the DEIS that the leachate will be sprayed for dust control on the landfill or "if feasible" diverted to aeration/oxidation treatment lagoons at the base of the landfill. What is meant by "if feasible?" If the leachate is to be treated on site what happens to the effluent? If it is not feasible to treat it on site what happens to the leachate? The Sewer Authority Midcoast (SAM) is planning to expand its treatment plant in Half Moon Bay. The draft environmental impact report prepared for that project mentions that the leachate from OX Mountain Landfill will be treated at the SAM plant. BFI's Executive Director, explaining to the SAM board at their last meeting, stated that additional capacity had been included to treat the leachate. He gave the impression that he had been approached on this subject and that he had received a veiled threat that, if SAM would not treat the leachate it would no longer be allowed to dump its sludge at OX Mountain.

As I understand SAM is permitted to dispose of its sludge at OX Mountain because it is not as hazardous as the sludge produced where the treatment plant serves more commercial and industrial customers than we have on the Coastside. Leachate is chemically considerably different than the waste water presently treated by SAM and would require considerable pre-treatment before entering the SAM plant. Furthermore, the OX Mountain Landfill is located a mile or more beyond the boundary of the SAM service area. In order for SAM to treat the leachate, assuming the member agencies will agree to this action, its service area will have to be expanded and that most likely will require amending the local Coastal Plan. Because none of this is discussed in the DEIS can I assume that the leachate will be disposed of in some other manner and that we need not be concerned about loading our sludge disposal site?

The improvements suggested on page 5-50 as traffic mitigation measures should help to alleviate the conflict that currently

19-4

exists between commuter and landfill traffic on Highway 92. The DEIS is not clear on whether these "Mitigation Measures" will be implemented. Can we assume that these measures will be implemented, if the expansion is approved? A traffic light at this intersection would make it possible to turn left from the landfill access road onto Highway 92 safely.

Lastly, I would be remiss in not commenting on the DEIS's discussion of cultural resources having served as the director of the Western Office of the Advisory Council on Historic Preservation for 12 years. On page 4-88 it is stated that one prehistoric site has been recorded in the project vicinity. What does that site consist of and how far is it from the project area, access road and any other activity of the proposed expansion that might directly or indirectly affect the site? Is this recorded site a few flakes, some old bottles or one that is likely to yield important information? The next sentence on page 4-88 states that "[s]ince this region would appear attractive for prehistoric habitation, the low number of recorded sites can possibly be attributed to limited archaeological study of this area." But on page 4-91 it states that "[t]he absence of any significant cultural resources in the project area may be attributed to more desirable nearby spots for prehistoric habitation,..." Which is it?

On page 4-90 in reporting the field investigation the DEIS states that a prehistoric site and a historic site were located within a half mile of the project site. What are these? Are they of any significance? Might they be affected in any way by the proposed undertaking? What technique was employed in performing the field survey? Binoculars and a jeep? Five meter transects? Were any difficulties encountered in performing the survey? The answers to these questions provide the background necessary to assess statements made later in the text about the probability of this undertaking affecting properties of cultural significance and the appropriate treatment. Without this additional information it is difficult to accept the statement on page 5-73 that because "no archeological artifacts were" found during the field investigations of the project area "the landfill expansion project could have no effect on cultural resources." Especially, when elaborate, even though they almost unintelligible, mitigation measures are proposed.

To summarize the DEIS needs to address mitigation measures in terms of what will be done and not in terms of what could or should be done. Furthermore, it should (1) address what will be done to incorporate mandatory recycling programs, (2) explain what is to happen to the leachate, (3) examine the installation of a

traffic light or a grade separated lane for left turning traffic from the landfill access road onto Highway 92, and (4) provide enough information on extant cultural resources, or the lack thereof, in order for the reader to evaluate the conclusions presented.

Sincerely,


Louis G. Wall

cc: Monterey Sanitary Board of Directors



—SCIENTIFIC AND REGULATORY CONSULTANTS—

6701 Center Drive West, Suite 900
Los Angeles, California 90045 1535
(213) 670-9221

8 July 1988

Colonel Galen H. Yanagihara
District Engineer
US ARMY CORPS OF ENGINEERS
211 Main Street
San Francisco, California 94105-1905

Re: 7 July 1988 Public Hearing on Draft Environmental Impact Statement--
Ox Mountain Sanitary Landfill, Apanollo Canyon Expansion Site, San
Mateo County, California (Regulatory Permit Application No. 16611891)

Dear Colonel Yanagihara:

You and the USACE staff are to be complimented for your competent conduct of the 7 July 1988 public hearing. Both proponents and opponents of the project were afforded ample time to voice their opinions in regard to this environmentally sensitive project.

20-1

Meredith/Boill and Associates' (M/R&A's) review comments on the draft EIS were submitted to you previously on 28 May 1988. One of the principal deficiencies identified therein was the lack of an adequate analysis of potential impacts on the endangered San Francisco garter snake. The presentations at the public hearing reinforced our concern that BFI has not addressed this issue adequately. Mr. Ralph Osterling, BFI's mitigation consultant, stated that over the course of "13,000 trap days" no endangered garter snakes were captured. Unfortunately, the draft EIS, nor Mr. Osterling, provided the actual trapping data and trapping methodology.

Based on the qualitative statements contained in the draft EIS, the majority of the speakers at the public hearing, including responsible politicians, simply have concluded that the garter snake is a "non-issue." This conclusion is not founded in fact. The US Fish and Wildlife Service reported (by telephone, 9 June 1988) that the garter snake had been trapped in a lagoon near the mouth of Pilarcillos Creek. Therefore, it is our contention that unless the garter snake trapping data and methodology are made available for review, it is not possible to evaluate any impact analysis regarding the snake. Until this information is provided to the concerned public, environmental organizations, and regulatory agencies, the potential impacts to this endangered species warrant an extension of the public comment period beyond 18 July 1988.

M/R&A requests that the garter snake trapping program data be placed in the public record immediately, and that we receive a copy at your earliest convenience. The public comment period should be held open for a sufficient period to allow interested parties to review and comment on the data.

20-2

20-3

M/R&A also concurs with Mr. James Hamilton of California Trout who stated that the draft EIS did not identify and quantify the aquatic invertebrate population of Apanollo Creek. The Creek presently functions as a source of detritus and invertebrates, which support the trout population of Apanollo Creek and Pilarcillos Creek. The invertebrate population should be inventoried, and the revised draft EIS should address the potential downstream impacts to the trout population due to the proposed elimination of 5,600 linear feet of stream channel and 285 acres of riparian and upland habitat.

Thank you again for orchestrating a successful public hearing. Significant environmental issues were raised; we trust that the USACE will address them fully during the revision of the draft EIS. If we can assist your staff in any way, please contact either of the undersigned.

Sincerely,

Thomas J. Dolan, P.E.

Project Manager

E. Clark Boll
Principal

TJD/ECB:ls

cc: Mr. Peter Vardy
Mr. Gino Scopel
Mr. Martin Sara
Mr. Norm Mattoon
Mr. Tom Blackman
MB-1982-2(56) File

MEREDITH/BOILL & ASSOCIATES, INC.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

SAN FRANCISCO BAY REGION
1111 JACKSON STREET, ROOM 9040
OAKLAND 94607

Phone Area Code 415
464-1735

July 20, 1988

File No. 2179.7117 (NOT)

Colonel Galen Yanagihara
District Engineer
U.S. Army Corps of Engineers
211 Main Street
San Francisco, CA 94105

Dear Colonel Yanagihara:

This letter provides additional comments on the Draft Environmental Impact Statement (DEIS) for the proposed Aparolito Canyon Class III Landfill near Half Moon Bay in San Mateo County. We have previously submitted comments to you on the DEIS in the form of our March 21, 1988 letter (copy attached).

In general, we find that the DEIS:

1. Predicts the elimination of approximately 3800 feet of a perennial stream (Aparolito Creek) with adverse impacts on associated beneficial uses in the landfill area and downstream portions of the creek due to reduced flow, and the reduction of groundwater resources used by area residents for domestic and irrigation purposes, and
2. does not document a mitigation plan of sufficient scale and permanence to compensate for the loss of beneficial uses.

21-1

21-2

Our March 21, 1988 letter, with attachments, requested you to address specific issues in the DEIS regarding the identification of the project impacts on beneficial uses of the waters of the State, the alternative analysis portion of the DEIS, and the mitigation plan for the project. The May 1988 DEIS did not respond to, or adequately address, many of the issues raised by our March 21, 1988 letter. Please ensure that the final DEIS responds to all of the comments raised by our March 21, 1988 letter and its attachments.

Thank you for the opportunity to comment on the DEIS. Please call Ken Theisen at (415) 464-1308 if you have any questions regarding our comments.

Sincerely,

Steven R. Ritchie
Executive Officer

Attachment

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

SAN FRANCISCO BAY REGION
1111 JACKSON STREET, ROOM 9040
OAKLAND 94607

Phone Area Code 415
464-1235

March 21, 1988

File No. 2179.7117 (NOT)

Colonel Galen Yanagihara
District Engineer
U.S. Army Corps of Engineers
211 Main Street
San Francisco, CA 94105

Subject: Proposed Aparolito Canyon Landfill, Half Moon Bay, San Mateo County

Dear Colonel Yanagihara:

Enclosed with this letter are our comments on the Administrative Draft EIS for the proposed Aparolito Canyon Landfill near Half Moon Bay in San Mateo County. These comments include, my March 11, 1988 letter to the project proponent together with the attached March 10, 1988 Internal Memo which addresses the mitigation plan portion of the Draft EIS, and my February 10, 1988 letter to the project proponent with the attached January 20, 1988 Internal Memo concerning the contingency plan.

As outlined in the enclosed comments we consider the Draft EIS to be incomplete. The Draft EIS does not identify all the impacts on beneficial uses of the waters of the State that may result from this project nor does it provide an adequate mitigation plan that complies with our Basin Plan.

The Draft EIS assumes that the quantity and quality of the creek and groundwater downstream of the project site will be maintained. However, this is not consistent with the Report of Waste Discharge for the project which identifies a 40% reduction in dry season streamflow and an increase in turbidity in the creek below the site. These adverse impacts to water quality and quantity must be identified in the EIS and plans developed to eliminate these impacts or they must be identified as unavoidable impacts and mitigation provided for the loss of additional beneficial uses of the waters of the State.

I request that you have the Draft EIS revised to respond to the enclosed comments.

REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION
 INTERNAL MEMO

Colonel Galen Yanagihara 2 March 21, 1988

TO: Roger B. James
 Executive Officer

FROM: Ken Thelsen, WPCB

Please call Ken Thelsen at (415) 464-1308 if you have any question about this letter or the enclosed comments.

DATE: March 16, 1988

SIGNATURE: *Ken Thelsen*

SUBJECT: Proposed Aparicio Canyon Landfill; Comments on Draft EIS

I have reviewed the Administrative Draft Environmental Impact Statement (DEIS), prepared for the Corps of Engineers by Harding Lawson Associates and dated February 1988, for the proposed Aparicio Canyon Landfill. I recommend that this memo containing my comments be transmitted to the Corps so that these comments can be addressed in the later versions of the DEIS that will be made public.

In general the DEIS did not provide much new information as compared to the EIR that was completed for this project. The DEIS does not provide an adequate evaluation of the beneficial uses of the waters of the State downstream of the site. Specifically, the characteristics of the aquifer in the lower canyon and the impacts of the project on the recharge of this aquifer and the creek have not been adequately addressed in the DEIS. There are also many inconsistencies and misstatements made in the DEIS that are of a minor nature and should not have a major impact on our presentation of this case to the Board for their consideration of waste discharge requirements.

The rest of this memo discusses the DEIS in greater detail according to the following three categories of comments: 1) Water Quality and Quantity Impacts, 2) Alternative Analysis, and 3) Minor Comments. The water quality and quantity comments concern issues that must be resolved prior to presentation of the case to the Board for their consideration.

WATER QUALITY AND QUANTITY IMPACTS

1. The endangered species question has yet to be resolved. The DEIS does not contain an adequate evaluation and determination of the presence, or lack thereof, of the San Francisco Garter Snake. Additional trapping for the snake will be conducted between March and the end of May, when the snake is supposed to be most likely found. The results of this trapping program must be included in the EIS before the EIS can be certified as a final EIS. The Board should not consider this case until the endangered species issue has been resolved to adequately document that no endangered species will be affected by the project.

Sincerely,
Laurence P. Kelly
 Roger B. James
 Executive Officer

Enclosures

SWRCB 2164 (4/75)

SURNAME:

6. The DEIS assumes that the design of the landfill will protect the quality and quantity of the water downstream of the site. As stated above the drainage design for the site shows that the quantity of the flow will be altered and that there would be an increase in turbidity. These are adverse impacts, and/or potentially adverse impacts, on the water quality downstream of the site. The reduction in streamflow will adversely affect the stream and riparian habitat beneficial uses of the lower creek and may impact the quantity of water used by the downstream landowners. These impacts must be evaluated in the DEIS.

7. The design of a landfill that controls runoff by diverting the water through a culvert underneath the landfill, as is proposed for this landfill, has not been a very effective design. In my experience, the water in the culvert beneath a landfill eventually becomes polluted and the water then must be diverted from the drainage basin to protect the water in the lower portion of the drainage basin.

Although the design for the Apollo Canyon landfill subdrain system may be more technically sophisticated, than other landfills that have similar designs and have failed, there is still the possibility that the designed subdrain and containment system may fail. Failure of the containment system at the landfill may cause the water in the subdrain, the bedrock groundwater, and possibly the groundwater below the toe of the landfill, to become polluted. Any corrective action implemented to protect downstream beneficial uses of the surface and ground water will result in the removal of additional water from the drainage basin/groundwater system.

The possibility of remedial action needed at this site to correct water quality problems resulting from a failure of the designed containment system, and the replacement of any beneficial uses lost due to this failure, is addressed more fully in the Contingency Plan submitted by BFI and our comments on this plan. (See attached January 20, 1988 Internal Memo) The DEIS did not identify these potential adverse impacts of the project.

ALTERNATIVE ANALYSIS

The alternative analysis determined that the Apollo Canyon site is the least environmentally damaging alternative that is economically feasible. The alternative analysis basically assumes that an alternative should be eliminated solely because it is more costly than the proposed project. This assumption was used to eliminate the Muff Canyon site which may be less environmentally damaging than the proposed project. The DEIS did not provide a thorough analysis/comparison of the water resources that would be lost or threatened by a landfill in Muff Canyon. However, based upon the limited available information it appears that there are less valuable beneficial uses of waters of the State within Muff Canyon as compared to Apollo Canyon. Additionally, the Muff Canyon site has already been somewhat degraded environmentally due to the existing quarry operation.

2. Page 1-8 of the DEIS states that the streamflows in Apollo Creek will be increased by approximately 19%. This is a very misleading statement and implies that there is a benefit to increased streamflows. This is not true. The drainage and sediment design plan for the site, Hydrocomp January 1988, estimated that based upon the final contours of the closed landfill there would be an annual increase of 19% in the streamflow. However, there would be approximately a 40% decrease in summer month flows. Despite the overall annual increase in streamflows there will be less water available for recharge of groundwater and the creek during the summer months. This will result in reduced streamflows in the summer months, possibly greater than estimated, and a reduction in the quantity of available groundwater in the lower canyon aquifer. The DEIS has not adequately addressed the impacts of the reduced streamflow and recharge on the beneficial uses of the lower Apollo Creek and aquifer. This issue is also discussed further in our comments on the mitigation plan portion of the DEIS.

3. The Report of Waste Discharge (RWD) for the site estimates that between 4 and 8 acre feet of groundwater storage will be eliminated due to the elimination of the alluvium and colluvium during the construction of the landfill. Additionally, the weathered bedrock is estimated to contain approximately 160 to 370 acre feet of storage capacity for groundwater. The landfill design provides for the draining of this bedrock groundwater so that this water will not be available for use or for recharge of the lower canyon aquifer or the creek. This will also contribute to the reduced streamflows during the dry season. This impact is not discussed in the DEIS.

4. In addition to the reduced streamflow the sediment control plan estimates that there will be an increase in the amount of fine grained sediment in the runoff from the site and the drainage basin. Although the overall sediment loading of the creek is designed not to be increased based upon the sediment plan the type of sediment will be changed from coarser grained material to a more fine grained material. This will result in an increased turbidity in the creek below the landfill during major storm events. This means that the turbidity may extend for a longer period of time, and at a greater distance from the site, due to the fine grained material not settling out in the same manner as the current sediment loading in the creek. The impacts of this increased turbidity were not adequately evaluated by the DEIS.

5. The mitigation plan portion of the DEIS is inadequate and does not respond to the requirements of the Basin Plan. Comments on the mitigation plan portion of the DEIS have been transmitted to BFI, and the Corps, as part of our March 11, 1988 letter to BFI. (See attached March 11, 1988 letter with March 10, 1988 Internal Memo)

The economic analysis portion of the alternative comparison is not in sufficient detail to allow evaluation. The economic analysis shows that proposed project would be the least costly in economic terms but does not represent the true costs of the proposed project. The economic analysis uses the existing tipping fee at the existing landfill, which will not be the tipping fee at the proposed site, to compare the costs of the various alternatives. All costs of the proposed project, including the costs of possible remedial action and the replacement of additional beneficial uses of the waters of the State that would be lost due to implementation of a remedial action plan to correct a failure of the landfill containment, should be considered in the economic analysis.

The costs of the Muff Canyon alternative should be similar to, if not less than, the costs of the proposed project. The Muff Canyon alternative may be less expensive than the proposed project because any potential remedial action at the Muff Canyon site may be less expensive than the proposed project because less valuable beneficial uses of the waters of the State would have to be protected and/or replaced by the remedial action plan. The economic analysis should provide much greater detail regarding the costs that are being compared.

Relatively speaking, the results of the economic analysis may not be significantly changed by doing a more detailed breakdown of the costs that are being compared. It will normally be relatively more expensive to haul garbage to a landfill in another county due to the transportation costs and the transportation fees, in addition to the normal tipping fees at the receiving landfill.

Although the costs of using a landfill in another county may be more than the proposed project the environmental damage may be less. Additionally, the fact that the City and County of San Francisco uses a landfill in another county demonstrates that this alternative is not economically and politically infeasible. A more thorough analysis of the no project alternative, that would involve the use of a landfill in another county, should be included in the DEIS.

MINOR ISSUES

1. Page 5-90 asserts that a failure of the designed containment at the landfill could result in the loss of a domestic water supply. The failure of the designed containments could result in the loss of additional beneficial uses. The beneficial uses that may be lost could include 1) agricultural supply, 2) a potential municipal supply, 3) maintenance of the streamflow to maintain the stream and riparian habitat and the associated beneficial uses of the stream, and 4) less water being available in the drainage basin/groundwater system for recharge of the groundwater and stream.

2. Page 2-13. We have determined that a Section 402 permit will not be necessary for this project. The Regional Board must certify the Corps of Engineers Section 404 permit pursuant to Section 401 of the Clean Water Act based upon findings by the Regional Board that the waters of the State will be protected and acceptable mitigation for the loss of beneficial uses for waters that cannot be protected.

3. Page 2-10. Include the Pescadero Transfer Station.
4. Page 2-11. Statement that 3.43 acres of wetlands will be "disturbed". These wetlands will be destroyed not disturbed.
5. In the comparison of the Muff Canyon alternative it is assumed that there will be a need for traffic improvements on Highway 92 at the access to the canyon. This may not be necessary. Access to Muff Canyon could be the same as for the proposed project by using the existing access road and landfill to provide access over the ridge from the existing landfill.
6. Page 1-12. If the designed containment of the landfill fails the project proponent may have to provide treatment of leachate and polluted water and pipe the treated effluent to the sanitary sewer system. This could have an impact on the sewage system of Half Moon Bay and this should be identified in the DEIS.
7. Page 1-23. The DEIS should be more specific in identifying the County's "long term" need for a solution to their solid waste disposal problem.
8. Page 2-8. The Regional Board has never considered this project and has never taken any action that could be construed as support for plans to develop a landfill in Apurullo Canyon after the existing landfill reaches capacity. The Regional Board staff has always expressed reservations about siting a landfill in Apurullo Canyon and has repeatedly conveyed these concerns to the project proponent and the County.
9. Page 3-30. The DEIS should identify what is meant by the "proper treatment and disposal of leachate". The current plans for the landfill should have estimated the quantity of leachate that may be generated at the site, per our previous request, and use this estimate to evaluate alternatives for the handling of this leachate. There are currently no submitted plans for leachate ponds which are identified in the DEIS and it may be necessary to convey leachate and/or polluted groundwater out of the canyon because the quantity of leachate/polluted water that may need to be handled.
10. Page 3-46. The project proponent has submitted phased construction plans for the construction of the landfill in order to minimize erosion problems. These plans should be identified in the DEIS.
11. Page 3-48. The landfill will have to be closed according to the requirements of Article 8 of Subchapter 15, of Title 23, Chapter 3 of the California Administrative Code, and not Regional Board RBR 77-70 as stated in the DEIS.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

SAN FRANCISCO BAY REGION
1111 JACKSON STREET, ROOM 4040
OAKLAND 94607



Phone Area Code 415
444-1233

12. Page 3-50. If it is determined that the designed containment at the landfill has failed and there is evidence of groundwater or surface water pollution at the site the project proponent would be responsible for corrective action. The DEIS mistakenly identifies an advisory committee that includes members from the Regional Board, the IEA, and the operator. The County has indicated that they will not be involved in any aspect of the corrective action or the evaluation of alternatives. The operator will have to submit a corrective action plan and the Regional Board will consider the plan upon a demonstration by the operator that the beneficial uses of the waters of the State will be protected and/or replaced if the beneficial uses are already lost due to the pollution. This issue is addressed more fully in our comments on the Contingency Plan.

13. Page 5-4. Implementation of the contingency plan may actually contribute to the downstream impacts on water quantity and quality. Implementation of the contingency plan will more than likely involve the removal of additional water from the drainage basin/groundwater system which, as discussed above and in our other comments, could adversely affect the stream and riparian habitat and the quantity of water available for downstream users.

14. Page 5-80. The costs of potential remedial action that include discharge of treated leachate and polluted groundwater to the sanitary sewer system, after pretreatment, should be included in the costs of this project.

15. Page 6-4, Table 6.2.1. Except for the submittal of the Report of Waste Discharge in June of 1986 this table does not identify any of the many additional interactions the Regional Board staff has had with the project proponent.

SUMMARY AND CONCLUSION

The DEIS is not much different than the EIR for this project. The EIR did not adequately identify the potential environmental impacts of the project, nor did it provide an adequate alternative analysis. The EIS was supposed to correct these deficiencies. This memo, together with our previous comments on the mitigation plan and the contingency plan, identify the potential impacts of the project that we are concerned about. In general, much greater detail should be provided to document the impacts of the project and the proposed mitigation measures to replace and mitigate unavoidable impacts. Additionally, a more detailed alternative analysis that clearly outlines the costs of the proposed project, that includes potential remedial action and the replacement of additional beneficial uses of the waters of the State that could be lost.

Attachments: Letter to BFI dated March 11, 1988 w/attachment
Letter to BFI dated February 10, 1988 w/attachment

March 11, 1988
File No. 2179-7117(B77)

Mr. Lino Valbuesa, Vice President
Browning-Ferris Industries
P.O. Box 1068
San Carlos, CA 94070

Dear Mr. Valbuesa:

Attached to this letter are the staff's comments on the draft mitigation plan, that is part of the Environmental Impact Statement (EIS), for the proposed Apollo Canyon landfill. We have received the administrative draft EIS and will submit comments on the EIS to the Corps of Engineers under a separate cover. However, due to the magnitude of the staff's comments on the proposed mitigation measures I am transmitting the attached comments to you so that you can modify the mitigation plan to be more responsive to the requirements of the Board's Basin Plan, and in order to minimize any additional delays in the Board's consideration of this project.

Due to the magnitude of this project and the water resources that will be lost I consider the draft mitigation plan to be lacking in detail. Additionally, the mitigation plan proposes mitigation measures that are inconsistent with the design plan for the landfill and the requirements of Subchapter 15 as well as mitigation measures that are proposed on property not owned by BFI. I will recommend that the Board accept mitigation measures on property not owned by BFI only if you supply the Board with evidence of the approval of the property owner to allow the work to be completed and maintained in perpetuity. Additionally, the mitigation plan must be consistent with the design of the landfill, the requirements of Subchapter 15, and the requirements of the Board's Basin Plan.

The Board's Basin plan requires that there be no net loss of wetland acreage or habitat value when the project and the proposed mitigation measures are considered together. The draft mitigation plan does not provide details for any of the proposed mitigation measures to ensure that the mitigation plan will comply with the requirements of the Basin Plan. Additionally, the plan proposed mitigation measures outside the Pilarcitos drainage basin which may be inconsistent with legal guidance we have received from the State Water Resources Control Board in the June 5, 1987 memo. These proposed mitigation measures, like the rest of the plan, are lacking in sufficient detail to evaluate their value as mitigation. I am concerned about the Board's ability to accept mitigation measures outside the Pilarcitos drainage basin without first requiring every effort be made to provide mitigation within this drainage basin.

REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION
 INTERNAL MEMO

March 11, 1988


Mr. Lino Valbusa

2

The plan should be modified to provide specific details of each mitigation measure and the beneficial uses that it is designed to mitigate. The plan should specifically address all the existing and potential beneficial uses of the waters of the State that will be lost or adversely affected by the project. These details should include a map showing the specific location of each mitigation measure, in such more detail than that provided in the draft plan, as well as detailed design plans. The mitigation plan should also clearly specify the existing conditions at each mitigation location and evaluate the project together with the proposed mitigation measures to ensure compliance with the Board's Basin Plan. Additionally, please ensure that the revised plan responds to the staff's comments in the attachment to this letter.

We have also received comments on the mitigation plan from the Department of Fish and Game. Together with our comments it appears that there is still much more work that needs to be done to finalize the mitigation plan to satisfy the requirements of the Regional Board and the Department of Fish and Game. We will be arranging a meeting with representatives from Fish and Game to discuss the mitigation plan and will also be contacting you about arranging a meeting with yourself and other concerned agencies.

Please call Ken Theisen at (415) 464-1308 if you have any questions regarding this letter or the attached comments.

Sincerely,

 Roger B. James
 Executive Officer

Attachment

cc w/Attachment

Barney Opton, Environmental Branch, U.S. Army Corps of Engineers
 Don Lollock, Department of Fish & Game
 Karen Miller, U.S. Fish & Wildlife Service
 David Nichols, County Manager, San Mateo County
 Dan Rhoades, Purcell, Rhoades & Associates
 Ralph Osterling Consultants, Inc.
 Edgar B. Washburn, Washburn & Kemp
 John Richards, SWRCB
 Jesse Diaz, SWRCB
 Sandra Anfang, Half Moon Bay Library

TO: Roger B. James
 Executive Officer

FROM: Mike Carlin, ES III
 Ken Theisen, WRCE

DATE: March 10, 1988

SIGNATURE: 


SUBJECT: Proposed Apurilico Canyon Landfill, Draft Mitigation Plan

Browning-Ferris Industries (BFI) has submitted a copy of the mitigation plan that is part of the Draft Environmental Impact Statement (EIS). Due to the magnitude of our comments on the proposed mitigation we have reviewed the proposed mitigation plan separately and will comment further on the other portions of the Draft EIS in a separate memo.

We have discussed the proposed mitigation plan with members of the Department of Fish and Game, The U.S. Fish and Wildlife Service, and other members of the staff. We received many conflicting comments from all of the discussions. In general, only one person, of all of the people that we have talked with, seems to be supportive of the draft mitigation plan. Since none of the comments that we have received on the plan are official, or in writing, we do not wish to comment on other agency's comments but will give our own evaluation of the plan.

The proposed mitigation plan is not responsive to the requirements of the Basin Plan. The draft mitigation plan (the plan) does not evaluate the proposed site, and the associated loss of resources and beneficial uses of waters of the State, together with the proposed mitigation measures to demonstrate that no net loss of acreage or habitat value will result from the combined projects. The Basin Plan requires that no net loss of acreage and habitat value be present when both the site and mitigation lands are considered together. The plan does not adequately evaluate existing conditions where the mitigation is proposed nor discuss what existing habitats will be modified or replaced by the proposed mitigation measures.

The proposed project will result in the loss of 3,676 feet of a perennial stream that is used for fish habitat and can potentially be used for fish migration and spawning. The project will remove approximately 4 acres of wetlands and 5 acres of riparian habitat. The proposed project will also significantly modify the upper reaches of the Apurilico Canyon drainage basin by attempting to eliminate infiltration and recharge of rainwater. This could adversely affect the recharge of water into the lower Apurilico Canyon Aquifer and the creek. The development of the landfill will eliminate alluvium and colluvium in the upper portion of the Apurilico Canyon drainage, that contain usable groundwater, thereby eliminating a portion of the upper reaches of the Apurilico Canyon Aquifer.

SWRCB 228A (6/75)

CITATION: A11F

INTRODUCTION TO THE PROPOSED MITIGATION PLAN

The introduction to the plan specifies the impacts of the proposed project as discussed above. The plan did not specifically address all of the actual beneficial uses that will be lost or adversely impacted due to the project. However, the actual acreage or habitat values will not be charged significantly by any additional comments from other agencies; with the possible exception of the endangered species habitat values which have yet to be adequately addressed. The plan did not address the loss of the groundwater resources in the upper reaches of the drainage basin nor did it address the projects overall impacts on the recharge of the creek and lower canyon aquifer due to the modification of the drainage basin characteristics.

The introduction also states that 58 to 75 acres of the site will be cleared during the first five year initial construction period and then clearing will cease for five years. Thereafter, construction will clear approximately 5 acres per year. The clearing of 5 acres per year is not consistent with the proposed development plan for the landfill that involves the construction of liners and LPS. Additionally, we seriously question whether 5 acres per year will provide enough capacity for one year.

BFI is proposing to implement all of the outlined mitigation measures within one year of receiving all permits for the project. However, the plan does not provide assurance of this since many of the proposed mitigation measures are on property not owned by BFI and BFI has not yet secured the approval of the various landowners to complete the proposed work. Therefore, BFI may not be able to implement many of the proposed mitigation measures and some other mitigation would have to be found and approved of by the Board as being equivalent; after the Board adopts MTR. We recommend that you ask the Board not to accept mitigation measures unless the Board is provided assurance that the mitigation can be implemented and maintained.

MITIGATION MEASURES NOS. 1 AND 2

The plan proposes to mitigate the loss of 3,676 feet of stream channel by replacing existing low flow barriers on the lower Apapollio Creek and Pillarcitos Creek. Although this mitigation measure may be useful in improving existing conditions in Pillarcitos Creek it will not replace the 3,676 feet of stream that will be lost forever.

The existing low flow barriers prevent the migration of fish during moderate to low flows in the creeks. When there is moderate to low flows in the creek it is not the time of year when the fish migrate and spawn. During the migration season the Department of Fish and Game requires that the low flow barriers be removed so as to allow passage for spawning. During dry years these low flow barriers may prevent migration even during the winter. However, migration may be limited in perennial streams under low flow conditions during dry years.

According to the January 27, 1988 Hydrocomp, Inc. report, submitted by BFI as part of the RMD, the construction of the landfill will increase the annual streamflow in Apapollio Creek by approximately 194 over the life of the site. Although this may seem like a benefit this is actually an adverse impact on beneficial uses because an increase in the quantity of runoff means that less water will be available in the drainage basin for recharge of the stream and groundwater. The Hydrocomp report estimates that the increase in runoff on an annual basis will actually result in a 40% decrease in the summer month flows over the life of the landfill because less water will be available to recharge the creek in the dry season.

Additionally, upon the completion of the construction of the landfill approximately 370 acre feet of storage capacity for groundwater will be eliminated. The construction of the landfill will eliminate all the groundwater in the alluvium and colluvium soils and effectively separate the groundwater stored in the weathered bedrock from the creek and the aquifer in the canyon below the landfill. Therefore, the storage capacity of the upper reaches of the drainage basin will be reduced thereby reducing the amount of water available to maintain streamflows during the dry season and to recharge the aquifer in the lower canyon.

The following is a list of what we consider to be the existing and/or potential beneficial uses of Apapollio Creek and the Apapollio Canyon aquifer and drainage basin:

- 1) Cold fresh water habitat, 2) warm fresh water habitat, 3) wildlife habitat, 4) fish migration and spawning, 5) water contact recreation, 6) non-contact water recreation, 7) municipal and domestic supply, 8) agricultural supply, 9) preservation of rare and endangered species, and 10) the drainage basin supplies recharge to the creek and aquifer to support the other beneficial uses.

In addition to the above cited water related impacts the project will also result in the loss or modification of approximately 250 acres of coastal scrub brushland and 20 acres of chaparral with scattered Douglas fir trees. This modification of the drainage basin characteristics will also have impacts on runoff, infiltration, and recharge in the drainage basin and aquifer.

The project will eliminate virtually all of the beneficial uses in the upper reaches of the drainage basin, where the landfill is proposed to be constructed, as well as pose a long term threat to these beneficial uses in the lower portions of the drainage basin and aquifer. The mitigation plan should propose replacement of all the beneficial uses that will be lost. The plan should also address the requirements of the Basin Plan and respond to the comments concerning mitigation outlined in the June 5, 1987 memo from the State Board (SBCB).

In general the text of the plan is not specific or detailed and the plan appears to rely strictly on numerical comparison rather than actual habitat value comparison. The following is a more in depth discussion of each element of the proposed mitigation plan.

Additionally, the plan does not provide adequate details of the proposed improvements to these low flow barriers that demonstrates that a different type of low flow barrier will allow fish migration while the existing barrier will not allow migration; especially since the Dept. of Fish and Game requires that these low flow barriers be removed during the migration season. The plan also does not provide adequate details on the comparison of the existing conditions together with the loss of resources due to the landfill construction and implementation of the mitigation plan as required by the Basin Plan.

If the plan is modified to provide a more thorough discussion of existing conditions, evaluates the project together with the proposed mitigation as required by the Basin Plan, and provides a more detailed design of the proposed improvements to the low flow barriers, these proposed improvements may be acceptable as part of an acceptable mitigation plan.

The plan proposes to improve the low flow barrier on Pilarcitos Creek at the Highway 92 undercrossing and to install a total of 50 instream improvements on lower Aparolito Creek. These proposed mitigation measures are on property not owned by BFI and there is no guarantee that the mitigation will remain effective in perpetuity or even that the current property owner will allow BFI to complete the proposed mitigation measures. Normally, proposed mitigation habitat is controlled by a conservation easement or deeded to some public agency that will not allow future changes that can eliminate the effectiveness of the proposed mitigation.

Additionally, we do not recommend that the Board approve a mitigation plan that includes elements that may not be completed because the current property owner will not allow the work to be completed. In order to assess the effectiveness of these mitigation measures BFI should provide documentation (i.e. easements) with the current property owner that will allow the work to be completed and maintained. BFI should also provide much more detailed plan and section design plans for all of the proposed "50" instream improvements, as well as the improvements on Pilarcitos Creek.

The plan also states that the improvement of the low flow barrier on Pilarcitos Creek will allow the "full utilization" of the upper reaches of Pilarcitos Creek. Map No. 2 of the plan shows that there is still a low flow barrier on Pilarcitos Creek that would prevent the "full" utilization of the upper reaches of Pilarcitos Creek above this barrier. This is very misleading.

MITIGATION MEASURE NO. 3

The plan proposes to develop riparian and wetland habitat surrounding the sedimentation ponds. The creation of riparian and wetland habitat in and around the sedimentation ponds will not be completely effective because the vegetation could be destroyed every year when the sedimentation ponds are cleaned of sediment. The plan did not provide any details of how the habitat will be maintained when the ponds have to be cleaned out annually. The creation of wetlands around a sedimentation basin that will be disturbed every year should not be acceptable replacement for existing undisturbed wetland habitat. In theory BFI may be able to direct the heavy equipment operator not to destroy the wetland habitat proposed to be established around the sediment pond but in reality the habitat would be destroyed, or at the very least significantly disturbed, every time the ponds are cleaned.

The riparian and wetland areas surrounding the sedimentation ponds would not be managed primarily as wildlife habitat to replace existing habitat. Therefore, we question whether the same habitat value will be maintained at the mitigation site vs. the proposed fill site. The value of wetland habitat created in an area where there will be continual landfill operations during the next 100+ years that will disrupt the habitat or the use of the habitat is not the same value as existing undisturbed wetlands.

It is also not acceptable to propose a mitigation plan that may not be effectively implemented until after the landfill is closed and the sediment ponds are no longer needed.

MITIGATION MEASURE NO. 4

This proposal for wildlife habitat control burns is not really related to the water related mitigation measures and does not provide any mitigation for the loss of any water resources. Our only concern about this is that a detailed control plan be submitted before any burning is implemented. The plan should ensure that the fire would be controlled so that additional water would not have to be used to control the fire. If water is used to control the fires then additional water will be introduced into the drainage above the landfill area that could adversely affect the landfill containment and drainage facilities and cause more leachate to be generated in the landfill.

MITIGATION MEASURE NO. 5

This appears to be a repeat of mitigation measure no. 2 that proposed up to 50 instream improvements in Aparolito Creek to improve fish habitat. This mitigation measure is also very unclear. The proposal states that two irrigation structures block fish migration to the upper 8498 feet of Aparolito Creek and the proposed mitigation is to replace these structures so that the "upper" 7480 feet of Aparolito Creek will be available for migration.

Our understanding is that the "upper" 3676 feet of Aparollito Creek will be placed in the subdrain system beneath the landfill. How then can the "upper" 7480 feet be opened up by replacing the irrigation structures. These distances should be re-evaluated and verified and the issue of what the "upper 7480 feet of the creek" applies to should be clarified. Additionally, the plan should show the specific location and a detailed design for these improvements and more thoroughly evaluate/compare existing conditions with what will be gained by this mitigation measure.

MITIGATION MEASURE NO. 6

The plan proposes to develop upland springs above the proposed landfill. It appears that the mitigation consultant did not consult with the landfill design engineer regarding the development of these springs. The drainage design for the site must divert all water above the landfill beyond the toe of the landfill as soon as possible to minimize recharge into the landfill that can increase leachate generation. The design of the landfill, as well as any WCR for the landfill, will require that all water be diverted downgradient of the landfill so as to minimize water that may come into contact with the buried refuse and generate leachate. Therefore, the "development" of these springs from the drainage design point of view is to ensure that the water is diverted off-site as soon as possible. This means that the "development" of the springs will reduce the amount of water available instead of improve the availability of water as stated in the mitigation plan. Therefore, this is not mitigation.

MITIGATION MEASURE NO. 7

This proposes to replant the bare streambanks. Additionally, according to Figure 3 of the plan the proposed streambank stabilization will include the excavation of the existing streambank before replanting. This excavation could eliminate existing habitat or modify existing conditions.

As discussed above the plan does not adequately evaluate existing conditions, together with the project and the proposed mitigation measures, to demonstrate that no net loss of acreage or habitat value occurs. The plan is very vague in this regard and much greater details should be provided. I believe that this mitigation measure could be very valuable as part of the overall mitigation package. However, more than a vague and general plan should be submitted before the true merits of this proposal can be evaluated.

MITIGATION MEASURE NO. 8

Currently there is a very small area at the upper end of the existing landfill where water ponds before being drained from the site by the surface drainage ditches. This pond is very small and is separated from the landfill by a cutoff wall. The proposal to enlarge and enhance this pond may contribute to additional infiltration of water into the landfill and contribute to an increase of leachate generation. The proposal to enlarge the pond is not consistent with the current site design and WCR. The ponding of more water upgradient of the existing landfill is a significant change in the site design and EPI should submit an amended RMD for the existing site to account for this change. The amended RMD should provide a detailed design for the pond and demonstrate that the proposed construction of the pond, at the proposed location, will not increase leachate generation in the landfill. Additionally, the proposal to pond water above the landfill is not consistent with the requirements of Section 2546(a) of Subchapter 15 and the amended RMD should ensure compliance with this requirement or apply for an alternative pursuant to Section 2510 of Subchapter 15.

The creation of ponds upgradient of a landfill may cause additional water quality problems at the landfill by increasing leachate generation and we recommend that the Board not approve of any mitigation proposal that involves this action. The design of any landfill should divert all water beyond the toe of the landfill as quickly as possible to minimize infiltration and leachate generation. This mitigation will only cause additional leachate problems at the landfill and may eventually have to be eliminated as part of a correction action plan. If this occurs there is no value to this mitigation proposal.

This proposal is also another example of my opinion the the mitigation consultant is not coordinating the mitigation plan with the landfill design engineers because the proposed mitigation is not consistent with the site design or the requirements of Subchapter 15.

MITIGATION MEASURE NO. 9

The proposal to vegetate the aeration ponds at the existing site is of questionable value. The primary purpose of the aeration ponds is not wildlife habitat but leachate control for the operation of the landfill. These ponds contain water from the subdrain system beneath the landfill that cannot be discharged to the creek because it becomes polluted. Granted, the water that is in the ponds now may be only marginally polluted but certain pollutants may become more concentrated in the ponds over time. This is why the water cannot be discharged to waters of the State.

As stated above the plan does not adequately evaluate the existing conditions and specify the net effects of the mitigation together with the project. The ponds were originally constructed by draining springs and destroying vegetation. Therefore, we believe that a much lesser value, if any value at all, should be placed on this proposed mitigation measure.

MITIGATION MEASURES NOS. 10 AND 11

These are not mitigation measures. Surfacing of the haul road and revegetation of the landfill slopes are standard operating procedures for any well run landfill.

MITIGATION MEASURES NOS. 12 AND 13

These two proposed measures may be very valuable. However, they are both outside the Pilarcitos drainage basin. According to the SACB June 5, 1987 memo, mitigation measures must ensure that there is no net loss of acreage or habitat value in the Pilarcitos drainage basin. The mitigation plan does not provide adequate details for the proposed mitigation measures and an adequate comparison of habitat values. Therefore, the plan has not demonstrated that no net loss of acreage or habitat will result in the Pilarcitos drainage basin. We must require every effort to be made to provide adequate mitigation within the Pilarcitos drainage basin before considering projects outside this drainage basin. Based upon the proposed mitigation measures within the Pilarcitos drainage basin it appears that full mitigation may not be possible within this drainage and the Board may be asked to consider these mitigation measures outside the drainage.

MITIGATION MEASURES NOS. 14 AND 15

Item No. 14 is not mitigation. This will be required by any MCR adopted by the Board. The same comments as those given on items nos. 10 and 11 also apply.

The maintenance of mitigation measures only on BFI property and only for the life of the project is not adequate. The beneficial uses will be lost forever so the maintenance of the mitigation measures proposed to replace these lost resources should continue in perpetuity to ensure compliance with the Basin Plan requirement of no net loss of beneficial uses.

MITIGATION MEASURE NO. 16

This is not mitigation but an attempt to ensure that the mitigation will be completed by posting a corporate guarantee of \$350,000. The plan does not provide details of the costs of the proposed mitigations measure so the amount and adequacy of this fund cannot be evaluated. Much of the proposed mitigation measures are proposed on property not owned by BFI and if the property owner does not allow the work to be done then the fund may have to be used to ensure no net loss of acreage and habitat value. The proposed amount of the fund may not be adequate to accomplish this goal.

MITIGATION MEASURE NO. 17

This proposes to consult with the Department of Fish and Game to acquire any additional water rights that are necessary to replace any surface flow reduction of Aparolito Creek as the result of the project. BFI has withdrawn their application for water rights in the canyon and any MCR adopted by the Board will have to require BFI to maintain the quantity and quality of the water in the canyon. Additionally, the Department of Fish and Game does not have the authority to grant water rights. The securing of water rights would have to be through the SACB Division of Water Rights.

MITIGATION MEASURE NO. 18

Monitoring of mitigation measures to ensure that the proposed mitigation is achieved is required for every mitigation plan. Adequate details of the proposed monitoring, to evaluate the proposed monitoring plan, are not part of the plan.

TOTAL MITIGATION RESULTS

Since the plan does not provide sufficient details to evaluate the net effects of the project and the proposed mitigation measures the estimates of the total mitigation results are grossly exaggerated. As stated above the plan does not adequately evaluate the entire project together with the mitigation measures to demonstrate no net loss of acreage or habitat value. The plan overestimates the value of replacing existing low flow barriers with a different type of barrier.

SUMMARY AND CONCLUSION

Overall the plan is vague and lacking in sufficient details to adequately evaluate the proposed project and mitigation measures to ensure compliance with the Basin Plan. Additionally, the Basin Plan does not specifically address the loss of a perennial stream, the groundwater resources, and the effects of the project on recharge into the aquifer and creek. We believe the Basin Plan policy on wetlands was designed to address the filling of wetlands and I do not think anyone ever thought that the Board would be asked to accept mitigation for the destruction of a perennial stream. To my knowledge this is the first case where the Board will address the loss of a perennial stream and we do not believe previous Board action on bayshore wetlands sets a precedent for acceptance of mitigation for the loss of the stream.

Considering the magnitude of the project and the beneficial uses that will be lost the mitigation plan should be much more specific and detailed. The plan should identify all beneficial uses that will be lost, or adversely affected, due to the project as well as all the proposed mitigation measures, to ensure no net loss of acreage and habitat value and to maintain the beneficial uses beyond the project boundary. The mitigation plan should also address the effects of the project on the recharge of the stream and the lower canyon aquifer and propose mitigation for adverse effects on these beneficial uses. As discussed above, the construction of the landfill will adversely affect the recharge of the aquifer and the flow in the creek and the mitigation plan did not address this issue.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

SAN FRANCISCO BAY REGION
1111 JACKSON STREET, ROOM 8040
OAKLAND 94607



RFI should be requested to significantly modify the mitigation plan by responding to the issues raised in this memo and to provide much more detailed plans, designs, and evaluations of all proposed mitigation measures to demonstrate no net loss of acreage or habitat value. We should also inform RFI that we are very concerned about their commitment, or lack thereof, to provide adequate mitigation for the beneficial uses that will be lost due to their project.

February 10, 1988
File No. 2179-7117(007)

Mr. Lino Valbosa, Vice President
Kroning-Farris Industries
P.O. Box 1068
San Carlos, CA 94070

Dear Mr. Valbosa:

Attached to this letter are the staff's comments on the draft contingency remedial action plan, and the draft contingency fund, for the proposed Apurilio Canyon landfill. These draft plans were submitted on your behalf by your consultants. Please review the contingency plan and fund to respond to the attached comments.

Please call Ken Theisen at (415) 464-1308 if you have any questions regarding this letter or the attached comments.

Sincerely,

Roger B. James
Executive Officer

Attachment

REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION
INTERNAL MEMO

TO: Roger A. James FROM: Ken Theisen, NCE
Executive Officer
DATE: January 20, 1988 SIGNATURE: *Ken Theisen*
SUBJECT: Browning-Ferris Industries (BFI), Proposed Aparollo Canyon
Landfill, Draft Contingency Plan and Fund

INTRODUCTION

I have reviewed the draft contingency plan and the draft contingency fund for the proposed Aparollo Canyon landfill. This memo comments on these two draft plans and proposes additions/modifications to the plans.

DRAFT CONTINGENCY REMEDIAL ACTION PLAN

In general the draft contingency plan is very thorough. The plan proposes not only inspection and maintenance procedures to be followed by the discharger but also outlines possible corrective actions should various design systems fail. The contingency plan proposes to inspect all drainage and containment features of the proposed landfill on a regular basis and before or after major storm and seismic events. This inspection schedule, together with the site monitoring program that is still being developed, should provide for adequate warning of the failure of any of the landfill design features.

I believe that the contingency plan and fund should provide more details of possible corrective measures and the funds necessary to accomplish the corrective action that would be necessary to address the worst case failure scenario. The rest of this memo provides comments on some of the additions/modifications that I believe should be made to both the contingency plan and the proposed fund.

THE CONTINGENCY REMEDIAL ACTION PLAN

The contingency plan should address the following issues in addition to the those issues already covered.

- 1) Based upon the estimate of the storativity and the site hydrological data an estimate should be made of the quantity and quality of polluted groundwater and surface runoff that the remedial action plan must address should the groundwater at the toe of the landfill becomes polluted and the runoff in the subdrain system becomes polluted.
- 2) The plan should include a conceptual design for a treatment and storage system that is sized and designed to treat all leachate, polluted groundwater from a groundwater extraction system used to control the spread of polluted groundwater beneath the toe of the landfill, and polluted water from the subdrain system.

3) The plan should include a conceptual design and location for a pipeline to the ultimate discharge location. This design should address the institutional method for the establishment of easements for the construction of the pipeline on property not owned by BFI.

4) Conceptual designs, as part of the phased development plans for the landfill, that will provide for the replacement of the subdrain system should the containment system fail and the leachate begins to migrate into the subdrain system should be included. This should include conceptual designs for surface drainage facilities to replace the subdrain system.

5) An evaluation should be made of the impacts on the lower Aparollo Canyon aquifer resulting from the removal of water from the entire drainage basin. An adequate evaluation of the amount of groundwater and surface runoff that will be removed from the entire drainage basin, and therefore not be available for recharge to the lower Aparollo Canyon aquifer, has not been submitted. If the designed containment fails the discharger will be required to prevent the loss of beneficial uses of the waters of the State. If the remedial action to correct the failure of the designed containment involves the extraction and treatment of groundwater and surface runoff, and piping the treated effluent out of the canyon, then the recharge of the lower Aparollo Canyon aquifer may be significantly reduced. The contingency plan should provide for a plan to ensure that the quality and quantity of the lower Aparollo Canyon aquifer is maintained and/or the replacement of the water that provides recharge into the aquifer. The contingency plan should provide documentation regarding the securing of a water supply that can replace all beneficial uses that may be lost due to a failure of the designed containment system.

THE CONTINGENCY FUND

The proposed contingency fund does not provide any details regarding what the fund is designed to accomplish. The proposed fund did not breakdown the potential costs of potential remedial actions and demonstrate that sufficient funds would be available should the groundwater at the toe of the landfill, and the surface water in the subdrain system, become polluted; and a corrective action program must be implemented to ensure compliance with any waste discharge requirements that may be adopted by the Board. The proposed contingency fund should also provide more details regarding the control and investment of the fund, the rate of buildup of the fund, and the return of the fund to those contributing should the funds not be needed.

The contingency fund should be connected with the contingency plan by ensuring that sufficient funds are available to accomplish the correction and mitigation of the worst case failure of the landfill containment. In general I believe the fund should provide funds to accomplish the following:

1. Rebuild the containment structure and grout curtain at the toe of the landfill.

In summary the contingency plan should provide conceptual design plans for the worst case scenario regarding the failure of the landfill containment system. The fund should use the worst case scenario to estimate the costs of remedial action as well as the costs of the replacement of all the beneficial uses that may be lost as the result of this failure. I believe that the items outlined above represent the worst case scenario, and that the contingency plan and fund should be modified to address these issues.

2. Install and operate, for as long as the pollution exists and the waste poses a threat to water quality, an extraction/treatment system that can handle all polluted groundwater, leachate, and polluted surface runoff from the site. The siting of the system, for planning purposes to determine the approximate cost, should be based on an estimate of the quantity of leachate expected based upon data from the existing landfill, an estimate of the storage capacity of groundwater upgradient of the toe of the landfill, and the quantity of surface and subsurface runoff in the subdrain system. The fund should provide monies to construct and operate a treatment plant based upon the conceptual design discussed above.

3. The construction of a pipeline to discharge the treated effluent from the treatment system into the sanitary sewer or an outfall that complies with the Basin Plan initial dilution requirement and appropriate water quality objectives.

4. Replacement of beneficial uses of waters of the State that could be lost. These include the following:

a) The current and potential drinking water supply and agricultural supply from the lower Apurilho Canyon aquifer, in perpetuity. For the purpose of this fund the costs, and ability to secure the rights, of securing a constant water source and the construction of the necessary delivery system, including maintenance, that will replace the loss of the lower Apurilho Canyon aquifer due to a degradation in quality or quantity.

b) Maintenance of the quantity and quality of Apurilho Creek below the landfill to ensure fish migration, spawning, and habitat; in perpetuity. Since the remedial action could involve the removal of surface water and groundwater from the entire drainage basin the fund should provide for the replacement of this lost water so as to maintain the above cited beneficial uses.

5. The closure of the landfill. This should include the construction of the final cover, the replacement of the subdrain system with a new site drainage system that complies with the requirements of Subchapter 15, and the maintenance of the cover and all drainage, leachate, and containment structures. Additionally, the fund should provide for the post closure monitoring of the site and the proposed mitigation plan features. For the purposes of the fund the post closure period should be considered to be at least 100 years beyond the final placement of waste at the landfill.

6. The maintenance of all the proposed mitigation plan features in perpetuity.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX

215 Fremont Street
San Francisco, Ca 94105

26 JUL 1958

Colonel Galen Yanagihara
District Engineer
US Army Corps of Engineers
211 Main Street
San Francisco, CA 94105

Dear Colonel Yanagihara:

The Environmental Protection Agency (EPA) has reviewed the Draft EIS (DEIS) for the OX MOUNTAIN SANITARY LANDFILL; APANOLIO CANYON EXPANSION SITE, SAN MATEO COUNTY, CALIFORNIA. Under the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act, EPA is required to review and comment on this DEIS. In addition, since a permit under Section 404 of the Clean Water Act eventually would be required, the proposed project will have to comply with EPA's 404(b)(1) Guidelines. Therefore, EPA has provided preliminary comments on the relevant 404 regulatory issues. We have summarized our main comments below; our detailed comments are enclosed.

Based on our review of the DEIS and our discussions with other agencies, EPA has a number of concerns about the environmental impacts that would result from the proposed project. As the DEIS notes, the proposed filling of Apanolio Canyon would result in the destruction of wetlands and the loss of riparian and fishery habitat values. The proposed project would eventually destroy 3.43 acres of riparian wetlands as defined by the Corps of Engineers, 4.57 acres of upslope riparian habitat, 5600 feet of perennial stream and 270 acres of upland habitat. By filling upper Apanolio Creek, the existing steelhead trout habitat would be lost and future enhancement would be permanently precluded. Several resource agencies and EPA consider this a significant steelhead stream, especially since much of the coastal steelhead habitat is becoming increasingly scarce due to severe degradation. In addition, given the projected hydrologic modifications, the proposal has the potential to adversely affect lower Apanolio Creek and Pilarcitos Creek as well.

Because of these impacts, EPA believes it is necessary for the Final EIS (FEIS) to provide more information about several key concerns.

One major concern is that the DEIS does not provide enough information about the availability of other alternate locations which may be less environmentally damaging. This information will also be necessary before a final permit determination can be made on the Apanolio Canyon site. Proposed discharges of fill would not comply with the 404(b)(1) Guidelines (hereafter referred to as "the Guidelines") if there is insufficient information to make a reasonable judgment as to whether the proposal complies with the Guidelines.

If an environmentally preferable alternative is available, the environmental impacts and risks inherent in the proposed Apanolio Canyon alternative could be avoided. We have included a discussion of the other possible alternatives in our detailed comments.

EPA recognizes San Mateo County's urgent need to establish additional sanitary landfill capacity. However, we recommend that the applicant attempt to meet this need using an alternate site with fewer environmental impacts. We believe the applicant should consider other combinations of alternatives. For example, the Corinda Los Trancos landfill alternative in conjunction with an aggressive waste reduction program may meet the needs with fewer environmental impacts than the "preferred" alternative in the DEIS. Similarly, the Muff Canyon alternative appears to be a less-damaging alternative. A modified approach may provide additional years to resolve the current institutional impediments to other less environmentally-damaging, long-term alternatives.

Another concern is that the DEIS does not adequately discuss the proposed habitat mitigation for the Apanolio Canyon proposal. We understand that the U.S. Fish and Wildlife Service and the National Marine Fisheries Service consider the current mitigation plan inadequate. There is also a significant question about the methodology used to determine the habitat values upon which the proposed mitigation was based. An adequate mitigation plan will be essential before any project could be permitted. We strongly recommend that a mitigation plan, acceptable to these federal resource agencies, be included with the FEIS.

Finally, the FEIS should include additional information about: 1) possible impacts on downgradient users and beneficial uses, 2) greater specificity regarding the contingency plan, and 3) concurrence from the Fish and Wildlife Service that the endangered species are not likely to be adversely affected.

Because of the concerns explained above, EPA has classified this DEIS as Category EO-2 (Environmental Objections-Insufficient Information.) (See the enclosed "Summary of Rating Definitions and Follow-up Actions.")

22-5

At this time, EPA is unable to determine whether the Apanolio site complies with the provisions of Section 404 of the Clean Water Act due to the lack of information. However, based on the information in the DEIS, our preliminary assessment is that the proposed expansion of the Ox Mountain Landfill into Apanolio Creek Canyon would not qualify for a permit under Section 404 of the Clean Water Act.

EPA appreciates the opportunity to review this DEIS and we are available to participate in followup meetings and discussions to resolve our concerns. Also, please send us five copies of the Final EIS at the same time it is officially filed with EPA's Washington D.C. office. If you have any questions, please call me at 415-974-8083 (FTS 454-8083) or have your staff call Mr. Rick Hoffmann at 415-974-8191 (FTS 454-8191).

Sincerely,

Deanna M. Wieman
Deanna M. Wieman, Director
Office of External Affairs

Enclosures (seven pages)

cc:
San Francisco Regional Water
Quality Control Board
National Marine Fisheries Service
U.S. Fish and Wildlife Service
California Department of Fish and Game

DETAILED COMMENTS

I. 404 Comments

Introduction

EPA has reviewed the DEIS to make a preliminary determination whether the proposed discharge would comply with Section 404 of the Clean Water Act and specifically the EPA's 404(b)(1) Guidelines ["the Guidelines"]. The Guidelines are regulations which the Corps uses to determine whether a proposed discharge of fill into waters of the United States qualifies for a Department of Army permit under Section 404 of the Clean Water Act. These regulations place certain restrictions on discharges of dredged or fill material, including:

- a. Permits may be granted only for the least environmentally damaging, practicable alternative to achieve the basic project purpose. Practicable means that the alternative is available and is capable of being done taking into account costs and technical and logistical feasibility, in light of overall project purposes [40 CFR 230.10(a)];
- b. Permitted projects must not violate state water quality standards, nor jeopardize the continued existence of any federally-listed threatened or endangered species [40 CFR 230.10(b)];
- c. Permitted projects must not cause or contribute to significant degradation of the aquatic ecosystem [40 CFR 230.10(c)]; and
- d. Permitted projects must include all reasonable and practicable measures to mitigate unavoidable impacts resulting from the discharge [40 CFR 230.10(d)].

As noted in the cover letter, proposed discharges of fill also fail to comply with EPA's 404(b)(1) Guidelines if there is not sufficient information to make a reasonable judgment about whether the proposal will comply with these Guidelines [40 CFR 230.12(iv)].

Based on the information contained in the DEIS, it appears that the proposed expansion of the Ox Mountain Landfill into Apanolio Creek Canyon would not qualify for a permit under Section 404 of the Clean Water Act.

Specifically, the permit applicant 1) has not rebutted the presumption that there are less environmentally-damaging, practicable alternatives to the proposed discharge of fill into Apanolio Canyon, 2) has not assured that all water quality issues are resolved, and 3) has not proposed mitigation adequate to offset the losses of fishery and riparian wetland habitat values resulting from the landfill expansion.

22-6

Our detailed 404 comments follow and are linked to the criteria listed above.

A. Alternatives Analysis

EPA has several concerns about the criteria used in the DEIS and the 404(b)(1) alternatives analysis. The DEIS lists a number of site selection criteria. However, fish and wildlife habitat values, a very important concern, apparently were not included. Also, it appears two criteria were also used that may artificially reduce the range of practicable alternatives. These limiting criteria appear to be that the landfill site must be within San Mateo County and that its lifespan must be 25 years or more.

The criterion that the landfill serve the County's needs for a minimum of 25 years, coupled with the fact that the Section 404 permitting process did not begin until the County's existing landfill was reaching capacity, places undue pressure on the Apanolio Creek Canyon alternative as the only site which is available and therefore practicable. Although EPA recognizes the desirability of identifying a long-term solution to the disposal of San Mateo County's refuse, EPA believes that such solutions must comply fully with Clean Water Act regulations. The requirement that a site serve for at least 25 years does not appear to be justified under the Guidelines, particularly if sites with less capacity prove to be available and are less environmentally damaging.

The DEIS evaluates six in-county alternatives. At least two appear to be less damaging practicable alternatives to the Apanolio alternative. These include the Corinda Los Trancos Forefill alternative and the Nuff Canyon Alternative. Inclusion of the fish and wildlife criteria and a modification of the twenty five year criteria might make these preferable alternatives.

In addition, the FEIS should expand the scope of the alternatives analysis to include some combination of in-county alternatives to meet the County's immediate waste disposal needs. One such alternative could be the initial use of the Corinda Los Trancos Forefill Alternative, an effective waste reduction program, and proceeding to secure approvals for less-damaging alternatives within and/or outside of San Mateo County. During the anticipated 16-year lifespan of the Corinda Los Trancos Forefill Alternative, Browning-Ferris Industries could seek out-of-county alternatives and/or seek to acquire the Nuff Canyon site, for example. EPA believes that the combined impacts of these alternatives may prove to be less environmentally damaging than the Apanolio Creek Canyon alternative.

In regard to the Nuff Canyon alternative, the FEIS should discuss the potential simultaneous use of the Nuff Canyon site as a landfill and as a sand and gravel quarry. The FEIS should evaluate use of the upper portions of Nuff Canyon as a landfill,

with gradual phasing out of the sand and gravel operations in the lower canyon as the landfill expands. The FEIS should discuss land ownership of Nuff Canyon and the potential for acquisition, with or without County assistance.

Modification of these criteria might have resulted in more than six in-county sites being available for further evaluation. In any event, the DEIS does not investigate the impacts and mitigation requirements of alternatives to Apanolio sufficiently to conclusively determine the least damaging alternative.

It appears that there may be a number of less environmentally-damaging alternatives which may be available outside of San Mateo County. The practicability of these alternatives appears to be a function of the time required to receive approvals for such out-of-county transfer of wastes and/or institutional impediments to receiving such approvals. The DEIS does not provide sufficient justification for rejection for out-of-county alternatives, particularly if shorter-term solutions to San Mateo's refuse disposal needs could be utilized in the interim.

B. Compliance with State Water Quality Standard and Endangered Species Act

Before compliance with this portion of the guidelines can be determined, more information will be needed in the FEIS. Specific concerns are discussed in the water quality and other comments below.

C. Impacts of the Project on the Aquatic Ecosystem

The proposed expansion of the Ox Mountain Landfill into Apanolio Creek Canyon appears to be the most environmentally-damaging alternative of those being considered in the DEIS. None of the other alternatives have the quantity or quality of fishery and riparian wetland habitat found in Apanolio. None of the other alternatives support steelhead trout, an extremely valuable anadromous species. None of the other alternatives appear to have the potential to affect water supplies and downstream beneficial uses to the degree described for the Apanolio Creek Canyon alternative.

The DEIS discusses the diversion structures downstream from the expansion site and their possible relationship to the value of Apanolio Creek as steelhead habitat. EPA does not believe that such potential barriers to upstream migration justify devaluing the existing and potentially restorable habitat for this valuable resource.

According to the California Department of Fish and Game (CDFG), Apanolio Creek is the largest perennial tributary stream in the Pilarcitos Creek watershed below Stone Dam, has the highest sum-

mer flows, and the best ratio of pools and riffles. Riffle and pool complexes are considered "special aquatic sites" under EPA's Guidelines and losses of such sites are considered to be among the most severe impacts contemplated under these Guidelines. Thus, EPA places extra emphasis on avoidance of impacts to such areas.

22-16 As discussed below in the water quality comments, construction of the proposed project could affect the downstream aquatic environment. More information is needed on this aspect before compliance with this portion can be demonstrated.

D. Mitigation

22-17 Mitigation measures were not developed fully for alternatives other than for the Apanolio Creek alternative. The FEIS should describe the mitigation requirements for each alternative in detail. To the extent out-of-county alternatives are evaluated, the mitigation requirements for these, if any, should also be discussed. EPA suggests that, prior to the release of the FEIS, all proposals for mitigation be evaluated by the U.S. Fish and Wildlife Service and National Marine Fisheries Service in addition to the California Department of Fish and Game. These federal agencies play an essential role in reviewing mitigation plans since they have the primary responsibility for anadromous fishery resources.

22-18 In this regard, the U.S. Fish and Wildlife Service and the National Marine Fisheries Service have expressed significant concerns about the appropriateness of the habitat evaluation procedure (HEP) conducted by Browning-Ferris Industries' consultant, and about the mitigation measures themselves. EPA shares these concerns and recommends that the inputs from these agencies be incorporated into the mitigation requirements. The FEIS should discuss the rationale used to establish the existing and future habitat values for each element considered in the HEP.

22-19 EPA does not believe that vegetation surrounding the proposed sedimentation basin should be credited toward replacement of the riparian wetland habitat which the project would destroy.

22-20 Certain mitigation measures proposed within the Pilarcitos Creek watershed and elsewhere appear questionable. For example, the proposal to modify a barrier to migration on Arroyo Leon Creek appears to ignore the fact that the stream is dewatered each summer below a summer agricultural diversion dam. Although there may be limited benefits to fish using the upper reaches of the stream above the dam site, this mitigation measure may not achieve its purpose for the majority of the stream, if provisions are not made to allow adequate flows below the summer dam.

22-21 The mitigation proposals do not appear to replace the instream fishery habitat that would be lost in Apanolio Creek canyon.

It appears as though there is a net loss of habitat acreage.

22-22 Proposals should consider flow augmentation in Pilarcitos Creek through water purchases, and establishment of buffer zones along Pilarcitos, Arroyo Leon, Apanolio, and Albert Canyon Creeks to allow re-establishment and protection of riparian wetlands and fishery habitat.

22-23 Mitigation proposals should indicate measures which would be incorporated into the 404 permit conditions which would assure that all mitigation features would be maintained in perpetuity, including any remedial measures that might be required, should certain elements of the mitigation proposal not achieve their stated goals. These assurances should include measures that may be required during the post-closure period, and may include bonding, escrow accounts, or other means acceptable to the Corps.

I. Water Quality Comments

1. The DEIS does not adequately discuss whether there will be adverse impacts on downstream beneficial uses. The DEIS and the CDFG indicate that expansion into Apanolio Canyon could significantly alter the amplitude and frequency of flows in Apanolio Creek. The DEIS states that the average annual runoff will increase by 19%. However, it also notes that the flows during the summer months could decrease from 0.05 cfs to 0.03 cfs, a decrease of 40%.

22-24 The FEIS should evaluate whether such flow regime changes will result in significant adverse impacts on fishery habitat and other beneficial uses both in the lower portion of Apanolio Creek or on Pilarcitos Creek downstream of the Apanolio confluence. It should discuss potential impacts on the hydrograph for Pilarcitos Creek. If there are permitting or other regulatory consequences of such a hydrological change, the FEIS should discuss these.

2. The DEIS concludes that the proposed Apanolio site will have no adverse water quality impacts because of the landfill design and a contingency plan. The assumption is that the landfill design will minimize leachate formation and fully contain any contamination which may result. We understand from the Regional Water Quality Control Board that the proposed landfill has been designed to stricter standards than are normally required for a sanitary landfill. We compliment the applicant on this approach.

22-25 Nonetheless it appears that there is some risk of failure due to a variety of factors. These include the fracturing and instabilities in the geological formations, the steep contours of the canyon, periodic heavy rainfall typical of coastal canyons, etc. Although the DEIS discussed many of these concerns, it did not evaluate the likelihood of a failure.

22-26 [A failure could cause adverse impacts on several downgradient beneficial uses. The DEIS briefly mentions that Browning-Ferris Industries is developing a "contingency plan" in the event of a failure; however, it is not clear what aspects are included and agreed-upon by the applicant.

22-27 [We strongly recommend that the FEIS include a more thorough discussion of the contingency plan. It should state what contingencies have been planned for and what measures have been included. If performance bonds are anticipated, these should be discussed.

22-28 [1. The San Francisco Bay Regional Water Quality Control Board must determine, through its 401 certification process, whether the alternative selected for permitting complies with water quality standards and adequately protects beneficial uses. The FEIS should discuss the process for completing this certification.

III. Other Comments

22-29 [1. The DEIS summarizes key aspects of several alternate disposal sites (Table 3.4-2). One element is the anticipated site life. It is not clear what assumptions are used to determine this figure. Are the estimates based on the current rate of filling at Corinda Los Trancos? Does it include importation of other counties' wastes?

22-30 [Waste reduction is a very important factor related to site life. The FEIS should more thoroughly discuss and clarify several questions:

22-31 [a. What waste reduction programs are currently in effect? Did the site life figures in the DEIS assume any waste reduction?

22-32 [b. What additional measures (if any) will be implemented in the future? What rate of waste reduction is assumed?

22-33 [c. How would waste reduction/recycling efforts within San Mateo County affect the lifespan of each of the alternatives, as well as the costs of refuse disposal to county residents? Costs are one of the criteria used to determine whether alternatives are practicable under the Guideline.

For example, we understand that the County's 1983 Solid Waste Management Plan identified recycling as a mechanism to decrease annual refuse disposal volume by 50%. Even if only partially successful, such a program could significantly lengthen the expected lifespan of County landfill sites.



United States Department of the Interior

OFFICE OF ENVIRONMENTAL PROJECT REVIEW
BOX 390H, 450 GOLDEN GATE AVENUE
SAN FRANCISCO, CALIFORNIA 94102

July 26, 1982

HAND DELIVERED

Colonel Galen M. Yanagihara
District Engineer
U.S. Army Corps of Engineers
211 Main Street
San Francisco, California 94105-1905

Dear Colonel Yanagihara:

The Department of the Interior has reviewed the Draft Environmental Impact Statement (DEIS) for the proposed Ox Mountain Sanitary Landfill, Apanolio Canyon Expansion Site, located in San Mateo County, California. The following comments are provided for your consideration when preparing the Final Environmental Impact Statement (FEIS).

GENERAL COMMENTS

23-1

For a project of this magnitude, which has a very long projected life, the U.S. Geological Survey recommends additional groundwater mitigation such as providing replacement water supplies for domestic, irrigation, or other use in the event that onsite mitigation measures should fail. It is not clear whether total storage of precipitation in the landfill has been considered in evaluating impacts on both groundwater recharge and surface-water flow. This should be clarified and documented.

23-2

If the alternative site in Nuff Canyon were selected, the Bureau of Mines advises that the landfill would conflict with the stone quarry operation and preclude future quarry operations up to the 1,000 foot elevation. The landfill at this site would also conflict with the nearby sand quarry operation.

23-3

The Bureau of Mines advises that the Corps of Engineers (Corps) field check each alternative site for mineral resources and assess possible effects of the proposed landfill expansion upon development of mineral deposits.

23-4

The proposed Ox Mountain landfill expansion in Apanolio Canyon would eliminate 3.43 acres of riparian wetlands as defined by the Corps, an additional 4.57 acres of upslope riparian habitat, 5,600 feet of perennial stream habitat, and 270 acres of upland habitat consisting of 250 acres of coastal chaparral and 20 acres of chaparral containing mature Douglas fir. The DEIS does not adequately describe the fish and wildlife resources associated with these wetland, upland, and perennial stream habitats on the project site. The proposed mitigation measures for offsetting riparian wetland habitat and perennial stream losses are also inadequate.

The Fish and Wildlife Service's (Service) initial comments on the Ox Mountain landfill expansion (in letters dated August 8, 1986, and September 30, 1986, to the Corps) regarded possible unauthorized activities at the proposed landfill site. Two culverted stream crossings had been constructed; fill had been placed in Apanolio Creek; and riparian vegetation was removed without authorization from the Corps. The Corps was requested to investigate these activities and, where appropriate, restore previously filled riparian and stream habitat.

The Service also provided comments on the Notice of Preparation for a Supplemental Environmental Impact Report (in a letter dated December 10, 1986, to the County of San Mateo) regarding the non-water-dependent nature of the proposed project. The aquatic and riparian habitats on the project site were determined to be valuable for steelhead trout and migratory birds; both habitat types are relatively scarce on a regional basis.

Upland habitats on the project site were determined to have high value to a variety of wildlife species, and are relatively abundant regionally. Mature Douglas fir stands in Apanolio Canyon were found to have high wildlife values, contribute to wildlife values of the riparian wetlands, stabilize and contribute to the watershed, and buffer the stream.

The Service, as the Department of the Interior representative, responded to the Corps' Pre-Discharge Notification on February 26, 1987. An individual permit was recommended for the project to offset the projected loss of high value habitats for fish and wildlife and the project's potential impact to endangered species.

The Service's comments on the subsequent Public Notice (letter dated July 7, 1987) described fish and wildlife resources in the project area and potential impacts on these resources and their habitats. Lost habitats would be irreplaceable. Because of the magnitude of fish and wildlife resource losses and the project's non-water-dependent nature, the Service recommended that the proposed landfill not be authorized and a less environmentally damaging alternative in the EIS be pursued.

The Service's June 2, 1987, comments to the California Coastal Commission regarded potential impacts to the endangered San Francisco garter snake. Because surveys in the project area for the endangered San Francisco garter snake were negative, the Service provisionally excluded this species from the project site's list of endangered and threatened species.

SPECIFIC COMMENTS

Endangered Species

Page 4-57 - 4-59. The FEIS should note that a survey for the endangered San Francisco garter snake conducted by Dr. Samuel McGinnis during the Spring of 1988 documented the presence of a population of the endangered San Francisco garter snake in the lagoon area near the mouth of Pilarcitos Creek.

23-5

23-6

Page 4-59. The Service agrees with Dr. Arnold's report in the Appendix of the FEIS regarding candidate invertebrate species that could be present at the site. Before a conclusion can be made, however, about the presence or absence of the San Francisco damselfly, Leech's skyline diving beetle, and Kicketcher's water scavenger, surveys should be conducted. All possible habitats that could be used by these species are unknown. The need for such surveys should be noted in the FEIS.

23-7

Page 4-61. The DEIS implies that surveys for the four candidate plants were not conducted because these rare taxa were "not expected to occur in the area." Evidently, a lack of prior collections from the project site or rudimentary descriptions of the habitat preferences of the candidate flora generated this expectation. However, regardless of the relative likelihood of occurrence for these plants, appropriately-timed surveys should be conducted after the project site by a qualified botanist. The FEIS should state that only after the completion of such floristic work can a determination be made regarding the presence or absence of candidate plants.

Underdrain System or Surface Runoff

Page 3-24 to 3-43, 3.5 Proposed Action and Alternatives, a. Apanolio Canyon Foot (Preferred Alternative) Landfill Design. The following comments are directed to the underdrain system for surface runoff:

23-8

The disposal of materials from the sedimentation basins should be discussed. These are not likely to be suitable for landfill cover and should not be placed where they will re-enter the stream. If these materials are incorporated into the landfill, an allowance should be made in the life of the project. On page 3-29, the assumption of a 4:1 ratio of refuse-to-cover would result in 250,000 cubic yards of cover material per million yards of refuse, rather than the 200,000 cubic yards stated. This could result in a significant miscalculation of the total excavation required for cover material over the life of the project.

23-9

Factors such as the limited range of hydraulic roughness of cast-in-place concrete pipe as well as channel gradient need to be further assessed to assure that the underdrain systems function properly.

23-10

The system of channels is designed to result in maximum velocities of 58 feet per second (page 3-38). This appears to be extreme and could result in excessive maintenance or failure of the channel. Furthermore, the "flip bucket" energy dissipaters shown in figure 3.5-11 for the perimeter ditch flows are indicated as being of rock construction. Consideration should be given to assessing the effect of the high flow velocities on these rock energy dissipaters.

23-11

The 100-year discharge for natural conditions is given as 1,575 cubic feet per second at the site boundary. The increase in peak flows due to the landfill will be offset by flood detention basins resulting in a slight decrease in peak flood flows by the end of the project. Assuming a slight reduction in

23-12

peak flows, the average velocity in the maximum diameter underdrain of 72 inches would still be in excess of 50 feet per second. Maintenance of such high mean velocities could result in excessive scouring of concrete pipe which might result in premature failure. The analysis does not appear to consider the effect of hydraulic head on the overall stability of the underdrain system and the landfill itself. Furthermore, the hydraulic effects of debris blocking the underdrain system need to be considered.

23-13

The FEIS should discuss measures to assure the integrity of the subsurface drainage system during a maximum expected earthquake. Failure of such a system, either from seismic activity or from inadequate hydraulic design would overload the leachate collection system and result in extremely high hydraulic pressure which could threaten the stability of the landfill.

23-14

The feasibility of routing all surface runoff around the perimeter of the landfill should be discussed as an alternative to the subsurface drain system. Failure of a surface diversion design would be easier to detect, less likely to result in contamination of groundwater, and repair would be less likely to disturb the integrity of the landfill.

Hydrology and Water Quality

Page 3-52, 3.5 Proposed Action and Alternatives, a. Apanolio Canyon, 1,200 Foot (Preferred Alternative) Contingency Plan. According to the DEIS,

23-15

groundwater collected under the landfill would be discharged into Apanolio Creek downstream of the landfill. The FEIS should describe how the groundwater collection system, lying several hundred feet under the landfill, would be repaired in the event of a system failure either by blockage of the collection pipes or through leachate contamination and what effects would result to fish and wildlife resources during the breakdown and repair period.

23-16

Page 5-13 to 5-14, 5.2 Hydrology and Water Quality, a. Apanolio Canyon, 1,200 Foot, Water Quality. The DEIS states that project construction and operation would induce soil erosion and increased sediment loads in the project area. It is predicted in the DEIS, however, that the total sediment load in Apanolio Creek will not exceed natural conditions. The FEIS should discuss the fact that instream habitat conditions in Corinda Los Trancos Creek downstream of the existing landfill do not support this prediction. In recent years, sediment discharge from the existing landfill has severely degraded fisheries habitat on Corinda Los Trancos Creek and may also be affecting habitat downstream in Pilarcitos Creek. This evidence suggests that downstream water quality in Apanolio Creek cannot be assured.

23-17

Failure of the landfill's clay liner or leachate collection and control system should include successful and unsuccessful examples of existing landfills in similar geological formations with perennial streams for comparison.

Fish and Wildlife Resources

Page 4-53, 4.3 Biology, 4.3.3 Aquatic, b. Apanolio Canyon. According to the DEIS, a barrier (i.e., the lower Bongard dam) on Apanolio Creek prevents steelhead trout from accessing 8,448 linear feet of upstream habitat "except possibly under extreme flood conditions". Steelhead trout upstream migration is thought to be triggered by surges of fresh water flow into the ocean in winter and early spring (Shapovalov and Taft 1954).

In Pillarcitos Creek, as is true of many other California coastal streams, steelhead cannot enter the drainage until winter rains break the sand bar closing the mouth of the creek. Once flows are adequate to allow upstream migration, adult steelhead can move upstream rapidly, spawn, and leave the stream after only a few days (Smith 1986). Steelhead can achieve darting speeds of greater than 24 feet per second (Bell 1984) and jumps of 6-10 feet over falls (Evans and Johnston stream until flows are adequate for fish to surmount obstacles (Shapovalov and Taft 1954).

Based on the natural migration abilities of steelhead and the following information, we conclude that the three dams on Apanolio Creek do not pose a barrier to upstream steelhead migration in most years. Phil Williams and Associates (1987) investigated the hydrology of Apanolio Creek during a flood event in February 1986. A peak discharge of 225 cubic feet per second with a flow depth of 3 to 5 feet was estimated at the lower Bongard dam. These flows and water depths would have allowed upstream steelhead migration.

As indicated in the DEIS on Page 4-27, Table 4-2-3, Hydrocomp (1988) estimated that a 2-year flood event would produce a peak discharge of 235 cubic feet per second at the applicant's property line. These data confirm that upstream steelhead migration past the lower Bongard dam can occur far more frequently than under extreme flood conditions. The FEIS should address this point.

Page 5-14, 5.2 Hydrology and Water Quality, a. Apanolio Canyon, 1,200-foot, Water Quality. The DEIS states that migration of leachates in groundwater may not contaminate Apanolio Creek because recharge between the stream and aquifer does not occur. Because groundwater from the Apanolio canyon aquifer does recharge into lower Pillarcitos Creek (Earth Metrics Inc. 1988), the FEIS should explore the impact leachate release into Pillarcitos Creek could have on fisheries and the endangered San Francisco garter snake, which inhabits Pillarcitos Creek near its mouth.

Page 5-23, 5.3 Biology, a. Apanolio Canyon, 1,200-foot, Vegetation. The DEIS points out that the estimates of wetland habitat on the project site range from 8 to 11 acres. Considering the value and regional scarcity of the resource in question, a more accurate wetland acreage figure, determined from low altitude aerial photography, is warranted and should be provided in the FEIS.

23-21

Page 5-26, 5.3 Biology, a. Apanolio Canyon, 1,200-foot, Wildlife. According to the DEIS, wildlife habitat would be eliminated at an average rate of 3 acres per year. The FEIS should also state that the most valuable habitats to fish and wildlife (i.e., the riparian and stream habitats) would be lost in the initial years of project construction.

23-22

During construction activities, small sedentary animals would not be temporarily displaced, as predicted in the DEIS. Instead, the FEIS should state that sedentary animals would be eliminated. It is also unlikely that Apanolio Creek could successfully re-establish territories in riparian habitat downstream or in other drainages. Given the rarity of riparian habitat statewide, it is probable that all riparian habitat functions are at or very near carrying capacity and cannot significantly accommodate displaced wildlife.

23-23

Page 5-27 to 5-29, 5.3 Biology, a. Apanolio Canyon, 1,200-foot, Aquatic. This section of the DEIS states that the portion of Apanolio Creek on the project site is resident rainbow trout habitat because of downstream barriers. We believe that sufficient information exists to support the contrary conclusion that Apanolio Creek is a viable steelhead trout stream. The following information should be addressed in the FEIS.

In addition to hydrologic evidence presented above, electroshocking data from Apanolio Creek also supports this conclusion. Fish sampled on the applicant's property in September 1986 and March 1988 showed strong 0 and 1 age classes similar to steelhead trout age class distributions found by the California Department of Fish and Game (CDFG) in other streams of the Pillarcitos drainage.

The absence of older age class fish (i.e., greater than 2 years) in Apanolio Creek is typical of steelhead trout streams.

Steelhead trout normally smolt and leave rearing habitat at 1 to 3 years of age (Moyle 1976). Steelhead smolts may leave the stream earlier in the spring in drought years in response to low flows and higher water temperatures. The presence of only one 2+ age class fish in the Apanolio Creek sample in March 1988 suggests that the majority of smolts had already left the stream by that date.

The March sampling of Apanolio Creek also revealed the presence of mature (i.e., capable of spawning) as well as immature rainbow trout of the same age class. A certain portion of steelhead populations, however, is known to spawn in its rearing stream without ever migrating to the ocean (Shapovalov and Taft 1954). Progeny of these fish may smolt and leave the rearing stream, thereby contributing to the steelhead population. This contribution would be most important in drought years when steelhead immigration is limited.

23-24

The DEIS states that a water resources protection contingency plan would be triggered if pollutants were detected in monitoring wells below the landfill. The FEIS should also clarify if water quality monitoring in

Apanolio Creek downstream of the landfill as well as other corrective actions associated with the contingency plan would be carried out in perpetuity or only through the life of the landfill project. The FEIS should also address the need to sample lower Pilarcitos Creek where groundwater recharge of the stream occurs.

23-25

The DEIS states that the landfill project would eliminate 3,676 feet of Apanolio Creek used by trout. According to the CDFG (1987), fisheries habitat extends 5,813 feet into the applicant's property to a natural waterfall barrier. Subtraction of the 1,018 feet of Apanolio Creek on the applicant's property, that would not be filled, leaves 4,795 feet of trout stream that would be lost. This discrepancy in amount of trout stream to be impacted by the project should be addressed in the FEIS.

23-26

Page 5-39, 5.4 Transportation, a. Apanolio Canyon, 200-foot. Increased garbage truck traffic on Highway 92 resulting from construction of the landfill also would increase the need for widening Highway 92. The Highway 92 widening project, as currently proposed by the California Department of Transportation (Caltrans), would significantly impact wildlife habitat in the region. The FEIS should discuss this indirect impact of the project.

Appendix B, Wildlife and Fisheries Mitigation Plan

23-27

Page 3, Introduction. The mitigation plan seems to overlook the policies of the Service. The Service stresses "avoidance" as the preferred mitigation measure for projects impacting biologically valuable habitat. The FEIS should specify how the proposed mitigation plan meets the guidelines used by the agencies.

23-28

Page 9, Pilarcitos Creek Watershed Streambank Revegetation. To offset riparian habitat losses, the mitigation plan proposes to replant over 800 feet of denuded stream bank with riparian vegetation. Riparian vegetation adjacent to the site proposed for revegetation was cut down and the Streambed channelized in 1987 without Clean Water Act authorization from the Corps or a Streambed Alteration Agreement from the CDFG.

Compensation for impacts on this portion of Pilarcitos Creek is the responsibility of the landowner who engaged in the unauthorized activity and does not represent mitigation for riparian habitat losses associated with the Ox Mountain Landfill project.

We understand that a Streambed Alteration Agreement between the CDFG and the landowner has been prepared. This agreement calls for the landowner to revegetate the stream banks and construct cattle enclosures, the same mitigation measures the applicant proposes to credit toward Apanolio Creek riparian habitat losses. This mitigation measure should be dropped from the FEIS.

23-29

The mitigation plan also states that the newly created riparian habitat will have a wildlife value of 7 within 3 years after planting. The Service believes

that within as little time as 3 years, this immature riparian habitat will not be more valuable to wildlife than existing riparian habitat on Apanolio Creek, habitat which is undoubtedly in excess of 200 years old. This habitat evaluation should be reassessed in the FEIS. (Also see further discussion under Apanolio Creek Watershed Wetland and Riparian Habitat, Page 16 comments).

23-30

Page 11, Pilarcitos Creek Watershed Barrier Modification. As part of the mitigation for the loss of over 3,000 feet of anadromous fish spawning and rearing habitat, the mitigation plan states that the applicant will correct a low flow barrier on Pilarcitos Creek at the Highway 92 bridge crossing.

Correction of this low flow barrier is included in a Streambed Alteration Agreement between Caltrans and the CDFG. According to Caltrans, a fish ladder will be installed at the Highway 92 bridge crossing by the end of 1992. Therefore, correction of this barrier cannot be considered a mitigation measure for the Ox Mountain landfill project. This mitigation measure should be dropped from the FEIS.

23-31

Table B-4, Upper Pilarcitos Creek with 92 Crossing Project. The FEIS should explain how cover, shelter, and food production would be improved upstream in Pilarcitos Creek as a result of removing the low flow barrier at the Highway 92 bridge.

23-32

Page 11 - 14, Apanolio Creek Watershed Fisheries Habitat. The document states that Apanolio Creek provides habitat for resident rainbow trout (*Salmo gairdneri gairdneri*). *Salmo gairdneri gairdneri* is the scientific name for steelhead trout. The FEIS should correct this error.

23-33

The mitigation plan states that in years with exceptionally high winter stream flows, steelhead trout may be able to ascend the existing physical barriers to use the creek as spawning and rearing habitat. Again, based on data reported by both Hydrocomp (1982) and Phil Williams and Assoc. (1987) and on our inspection of instream obstacles to steelhead migration, it is our belief that steelhead are able to ascend Apanolio Creek in most years.

23-34

On Page 12, the document states that no steelhead were observed in Apanolio Creek from September 1986 through March 1988, above the lower Bongard dam. The winters of 1986-1987 and 1987-1988 had lower than normal rainfall resulting in drought conditions in this watershed. During drought years, steelhead may not be able to negotiate the low flow barrier on the Bongard property and therefore their absence in this period (if indeed they were absent) is understandable.

23-35

The mitigation plan states that 3,075 feet of fish producing stream and 601 feet of non-fish producing stream would be lost. The DEIS text, however, refers to the loss of 3,676 feet of trout stream (Page -7) This discrepancy should be resolved in the FEIS. Also refer to our comments for Pages 5-27 to 5-29 regarding the CDFG estimated linear feet of trout stream on the applicant's property.

23-36

On Page 13, the mitigation plan hypothesizes that the lack of larger fish in Apanolio Creek is due to limited cover and shelter. The FEIS should include another hypothesis which is that the larger fish smolt and leave the stream. The mitigation plan states on Page 13-14 that the value of Apanolio Creek on the project site is fair (a habitat value rating of 4). The FEIS should acknowledge that the mitigation plan presents no instream habitat data or invertebrate analyses to support the conclusion that Apanolio Creek is only a fair spawning, food producing and nursery habitat.

23-38

Page 14 - 15, Apanolio Creek Watershed Barrier Modification. No data exist regarding the location of steelhead spawning habitat in Apanolio Creek. The majority of spawning habitat may occur on the applicant's property where it will be covered by the landfill. If this is the case, improving low flow barriers downstream may be of little value to steelhead. Consequently, we are unable to determine if this proposed mitigation measure will benefit steelhead trout. The FEIS should address this information gap.

23-39

Page 15 - 16, Apanolio Creek Watershed Instream Structures. As stated above, without specific information on the location of spawning habitat in Apanolio Creek, we cannot evaluate the value of constructing instream structures. If all or most spawning habitat for steelhead is removed as a result of project construction, improving downstream rearing habitat for steelhead trout will be of no mitigation value. In addition, we believe the predicted 40 percent reduction in summer flows (Page 5-11, Hydrology) could seriously compromise nursery habitat in Apanolio Creek downstream of the landfill. Rearing habitat, according to Behnke (1984), may be the critical factor limiting the abundance of wild steelhead populations.

23-40

The document states that low flow barrier modifications combined with creation of pool and cover habitat on Apanolio Creek will create high value fisheries habitat on the 6,498 feet of Apanolio Creek downstream of the landfill. Based on habitat conditions in Corinda Los Trancos Creek downstream from the existing landfill, the quality of the water, and in turn the fisheries habitat, in Apanolio Creek cannot necessarily be assured.

23-41

Page 16 - 17, Apanolio Creek Watershed Wetland and Riparian Habitat. The mitigation plan assigns only a "fair" habitat value of 6 (on a scale of 0 to 10) to the existing riparian habitat on Apanolio Creek. This assigned habitat rating grossly undervalues the Apanolio Creek riparian corridor. With the exception of recent unauthorized activities, riparian habitat in Apanolio Creek is pristine. A habitat value of 10 is justified in the FEIS.

23-42

Several of the evaluation species used to derive the habitat value for Apanolio Creek are inappropriate (i.e., waterfowl, shorebirds, and wading birds). Apanolio Creek provides little or no habitat for these species groups, which is verified by the values assigned to these evaluation species in Tables B-10 and B-11 (i.e., 1 and 0). These evaluation groups should be removed from the analysis and the value recalculated for inclusion in the FEIS.

23-43

The document refers in several paragraphs to the loss of 3.43 acres of wetland and 4.57 acres of riparian habitat. All wetland habitat that would be impacted by the project is riparian wetland habitat. No perennial or seasonal marshes that provide habitat for waterfowl, shorebirds or wading birds would be impacted by the landfill. Several of the mitigation measures, however, include creation of marsh habitat which would not provide replacement habitat for the majority of wildlife species currently inhabiting the Apanolio Creek riparian corridor. Marsh creation should not be considered mitigation for the loss of riparian habitat in the FEIS.

23-44

As partial mitigation for the loss of riparian habitat on Apanolio Creek, the mitigation plan proposes reestablishing marsh and riparian habitat around a sediment retention basin to be constructed downstream of the landfill. Marsh and riparian habitat is expected to be fully established in 5 years and have a wildlife value of 7, according to the mitigation plan.

Although marsh habitat may be fully established in 5 years, riparian habitat requires 50 - 100 years or more to fully re-establish former wildlife values. Achievement of a wildlife value of 7 within 5 years, which would be more valuable than existing riparian habitat on Apanolio Creek (rated as a 6), is unfounded scientifically.

The Service also questions whether an overall value of 7 could be achieved knowing that the wetland and riparian habitats could be disturbed during the more frequently required sediment pond dredgings. This habitat evaluation should either be revised to reflect expected conditions or eliminated from the FEIS.

23-45

Page 17-20, Apanolio Creek Watershed Upland Habitat. The mitigation plan concludes that coastal chaparral habitat on the project site is overmature and because of decreased amounts of high quality browse for deer, decreased seed production for birds and mammals, and poor wildlife access, the value of this habitat type is low. No botanical or biological data are presented in the FEIS from the project site or other coastal chaparral communities experiencing more frequent burn cycles. The supervisor for the existing landfill has stated that the deer population has increased in recent years on the applicant's property (McDevitt 1985). The FEIS should address this discrepancy regarding wildlife values of project area chaparral habitat.

23-46

The natural burn cycle for moist coastal chaparral communities is approximately every 50 years, suggesting that habitat in Apanolio Canyon is mature rather than overmature. The 10 to 15 year reburn cycle proposed in the mitigation plan, therefore, would be unnatural and overly disruptive to this plant community. A secondary impact of this overly zealous burn program could be increased sedimentation in Apanolio, Corinda Los Trancos, Nuff and Pilarcitos Creeks. The proposed burn program should be re-evaluated in the FEIS.

23-47

The mitigation plan states that all wildlife species would benefit from the proposed burn program. The FEIS should consider that burning would more likely

result in a significant change in the diversity of species inhabiting this habitat type. A number of species, including the dusky-footed woodrat, bobcat, white-crowned sparrow, spotted towhee and alligator lizard, that are dependent on older seral stages of coastal chaparral, would be eliminated or their populations severely reduced if the burn program proposed in the mitigation plan is implemented. In time this rigorous burn cycle would replace most of the mature coastal chaparral community in the project area with a chaparral community dominated by early successional stage plant species.

23-48

The mitigation plan describes a Douglas fir planting program (areas shown on Map D-2) to be undertaken after chaparral burning. A comparison of Map D-2 to Map D-3, which shows the chaparral cyclic burn areas, seems to indicate that the Douglas fir plantings would also be burned every 10 to 15 years. The FEIS should clarify the relationship of the Douglas fir plantings and the burn program.

23-49

Tables B-25, B-24 and B-26, (habitat value comparisons for uplands - Douglas fir and chaparral), waterfowl, shorebirds, and wading birds are inappropriate evaluation species for the site. The Service is unaware of any species of waterfowl, shorebird or wading bird that utilize chaparral or Douglas fir forest habitats. These species groups should be eliminated from the evaluation and the values recalculated for inclusion in the FEIS.

23-50

The mitigation plan also proposes construction of a one acre wildlife pond on the ridge below Scarpers Peak. This newly created marsh and riparian habitat would have a wildlife value of 9 after 3 years. The Service comments under Page 16-17, Apanolio Creek Watershed Wetland and Riparian Habitat, also apply to this mitigation proposal.

23-51

Page 20-21, Corinda Los Trancos Watershed Wetland and Riparian Revegetation. This section of the mitigation plan proposes to enhance marsh and riparian habitat around an existing pond at the head of the existing Corinda Los Trancos landfill. According to the document, the pond's wildlife value will increase from a value of 4 to a value of 8 within 2 to 3 years. The Service comments under Page 16-17, Apanolio Creek Watershed Wetland and Riparian Habitat, also apply to this mitigation measure.

23-52

Page 22, Corinda Los Trancos Watershed Wildlife Ponds. The mitigation plan proposes to construct three wildlife ponds below the existing landfill. After 3 years, marsh and riparian habitat around these ponds is projected to have a value of 7. Again, the Service comments under Page 16-17, Apanolio Creek Watershed Wetland and Riparian Habitat, apply to this mitigation measure. The FEIS should also clarify where these wildlife ponds would be located in relation to the existing leachate ponds below the Corinda Los Trancos landfill.

23-53

Table B-28 presents the habitat value comparison for the Los Trancos ditch revegetation. Waterfowl, shorebirds and wading birds are assigned a future habitat value of 7. These species groups can hardly be expected to

significantly utilize a concrete ditch with overhanging ceranothus shrubs. The Service recommends that these species groups be dropped from the evaluation.

Page 23-24, Arroyo Leon and San Pedro Creek Watersheds, Barrier Modification. The mitigation plan recommends correction of low flow barriers on Arroyo Leon and San Pedro Creeks. The Service questions whether correction of these barriers would significantly improve steelhead populations in these drainages.

23-54

The mitigation plan does not indicate what "low flows" in these creeks represent in terms of cubic feet per second or water depths. In the Pilarcitos Creek drainage, a bar often forms across the mouth of the creek during periods of low flow in the drainage. It is possible, therefore, that during low flow periods, steelhead would be unable to enter the drainage from the Pacific Ocean. Consequently, correction of low flow barriers under these conditions would not be beneficial to steelhead.

23-55

In addition, low flows may be insufficient to trigger upstream steelhead migration. Steelhead typically respond to high fresh water flows and move rapidly upstream. Encouraging upstream migration during low flow periods could also attract steelhead into portions of the stream that would ultimately be unsuitable to adult as well as juvenile fish survival because of low flows and high temperatures. The FEIS should provide a more detailed discussion of the value of correcting low flow barriers.

23-56

The Service inspected the "low flow barriers" and downstream structures on Arroyo Leon and San Pedro Creeks on June 22, 1988. The concrete culvert under Adobe Street in Pacifica poses no barrier to steelhead in or out migration during flow levels suitable for migration. Observations of streamflows in San Pedro Creek at the Adobe Street bridge and downstream indicate that if steelhead are able to negotiate the natural stream channel, the culvert at Adobe Street is also negotiable. Flow depths through this culvert, as well as downstream, were equivalent. This mitigation measure should be excluded from the FEIS.

23-57

Downstream from the low flow barrier on Arroyo Leon Creek are two 35-foot high concrete and flashboard dams. According to the CDFG warden, operation of these dams often interferes with steelhead migration. Consequently, the FEIS should state that providing improved passage for steelhead upstream of these water diversion structures would be of limited value unless operation of the dams could also be controlled.

23-58

Page 24, Maintenance of Sediment Control Structures. The mitigation plan states in relation to Apanolio Creek that "Changing the sediment characteristics by reducing the yield of sands and silt by 339 tons per year significantly enhances the aquatic habitat". The FEIS should explain why the aquatic habitat in Corinda Los Trancos Creek below the existing landfill has not been equally enhanced.

23-59

Page 27. Corporate Guarantee. Monitoring of the mitigation program for only 5 years will not insure success as suggested in the mitigation plan. Fish and wildlife habitat losses resulting from construction of the proposed project would be permanent. The applicant should guarantee the effectiveness of any mitigation program in perpetuity. The FLIS should address this shortcoming.

23-60

Page 28. Monitoring Fisheries. The mitigation plan proposes to modify existing low flow barriers on Pilarcitos, Arroyo Leon and San Pedro Creeks to allow passage of steelhead during low streamflow periods. The monitoring program, however, proposes post storm incident checks to confirm the presence of adult steelhead above the new fish passages. Monitoring during or after storm events will only verify passage during high streamflows and will not provide any information on the ability to pass fish during low streamflow periods. The monitoring plan should be corrected accordingly.

23-61

Page 28. Monitoring Riparian Vegetation. Baseline and postplanting wildlife monitoring, as is included in the mitigation plan for upland habitats, would also be appropriate for riparian habitats and should be addressed in the FLIS. Monitoring of plant survival only does not necessarily verify anticipated wildlife use.

SUMMARY COMMENTS

23-62

Apanolio Canyon represents a nearly pristine ecosystem comprised of high value upland, riparian and stream habitat. Contrary to the DLIS, the Service believes that Apanolio Creek is a highly productive steelhead trout stream. It provides significant spawning and nursery habitat for steelhead.

23-63

Considering the value and scarcity of such ecosystems, the Service believes the DLIS should provide more definitive biological and botanical data and references. Collection and analysis of this information would have greatly improved the quality and credibility of the impact assessment. Although our specific comments recommend correction of errors and omissions in the FLIS, the Service believes that preparation of a revised DLIS would be more appropriate.

23-64

The Service recommends adoption of either the no project alternative, which would be environmentally preferable, or adoption of the Corinda Los Trancos forefill alternative with appropriate mitigation for fish and wildlife habitat losses.

23-65

Of the other viable alternatives, both the Corinda Los Trancos and Huff Creek alternatives would substantially decrease the losses of both fish and wildlife resources. The Corinda Los Trancos alternative would have the lesser impact of the two alternatives, and the Bureau of Mines has pointed out that the Huff alternative would conflict with present mining operations and would preclude the stone quarry mine at the 1,000 foot elevation.

23-66

The U.S. Geological Survey has concerns about the landfill's underdrain system for surface runoff, and advises that further assessment is needed. Concerns

involve the hydraulic roughness of the cast-in-place concrete pipes, the channel gradient, maintenance of high water velocities which could result in excessive scouring of the concrete pipe and premature failure, and the effect of the hydraulic head on the overall stability of the underdrain system and the landfill itself. The U.S. Geological Survey also recommends additional mitigation in the event that the onsite mitigation measures fail.

We appreciate this opportunity to review and provide comments on the DLIS.

Sincerely,



Patricia Sanderson Port
Regional Environmental Officer

Attachment:
Literature Cited

ccs: Director, OEPR (w/orig. incoming)
Reg. Dir., FWS
Reg. Hydrologist, USGS
Chief, BH

LITERATURE CITED

- Behne, R.J. 1984. "About Trout - Steelhead Trout." Trout Magazine. Winter 1984:43-48.
- Bell, M. C. 1984. Fisheries Handbook of Engineering Requirements and Biological Criteria. U. S. Army Corps of Engineers North Pacific Division, Fish Passage Development and Evaluation Program. 290pp.
- California Department of Fish and Game. 1987. Report on Recent Sampling Efforts in Pilarcitos Creek Watershed for Evaluation of Potential Impacts to Steelhead Resulting from the Proposed Ox Mountain Landfill Expansion to Apanolio Canyon, San Mateo County. California Department of Fish and Game Memorandum. 8 pp.
- Earth Metrics Incorporated. 1988. Draft supplemental environmental impact report for the Inwood Corporation proposed Pine Center water supply development project. Prepared for the City of Half Moon Bay.
- Evans, W. A. and F. B. Johnston. 1974. Fish migration and fish passage. A practical guide to solving fish passage problems. U. S. Department of Agriculture, Forest Service Region 5 Report. 43 pp. plus appendices.
- Hydrocomp, Inc. 1988. Storm Runoff and Sediment Management at the Apanolio Canyon Landfill, January. Prepared for Broming-Ferris Industries of California, Inc. and Brian-Kangas-Fouk and Associates.
- McDevitt, M. 1985. "S M County's Garbage Can." Times Tribune article dated August 11, 1985.
- Moyle, P. B. 1976. Inland Fishes of California. University of California Press. 405 pp.
- Philip Williams and Associates. 1987. February 1986 peak discharge on Apanolio Creek, San Mateo Co. Letter to L. Ulmer, California Department of Fish and Game.
- Shapovalov, L. and A. C. Taft. 1954. The Life Histories of the Steelhead Rainbow Trout (*Salmo gairdneri gairdneri*) and Silver Salmon (*Oncorhynchus kisutch*) with Special Reference to Madge Creek, California, and Recommendations Regarding their Management. California Department of Fish and Game Fish Bulletin No. 98. 375 pp.
- Smith, J. J. 1986. Southern steelhead. Pages 14-17 In The Natural (and Unnatural) history of California Trout. Report of the California/Nevada Chapter of the American Fisheries Society.

Colonel Galen H. Yanagihara
District Engineer
Army Corps of Engineers
211 Main Street
San Francisco, CA 94105-1905

July 22, 1988

Re: Draft EIS for the Proposed Expansion of the Ox Mountain Sanitary
Landfill

The Committee for Green Foothills is an environmental organization concerned about wise land use and conservation of resources in San Mateo and Santa Clara Counties. We have been involved in land use planning and permit decisions over the past twenty-seven years. We have the following comments concerning the adequacy of the Draft EIS.

GENERAL COMMENTS

The EIS has not adequately considered alternatives to the proposed project. During the July 7 Corps of Engineers public hearing, it was repeatedly stated by representatives of San Mateo County and others, that the County had been "committed" to the Apanolio Canyon site for over 20 years. A precommitment on the part of the local permitting agency demonstrates a serious flaw in the requirements of CEQA and NEPA, i.e., a fair and thorough consideration of all alternatives.

Alternatives that need to be considered fully and implemented include a vigorous recycling and resource recovery program. Recycling coupled with other sites, such as Corinda Los Trancos landfill, should also be analyzed. San Mateo County and the applicant have not demonstrated a strong commitment to recycling, despite Committee for Green Foothills, and others, repeated urgings over many years. Recently, a county task force has initiated a voluntary recycling program, in response to the fear that permits for a new landfill site will not be ready by the time the existing landfill site is due to close. A mandatory program, with firm standards and deadlines for achieving significant reductions in the waste stream, is a minimum requirement for the contemplation of new sites for landfill. Without such a program, there is really no incentive to recycle, and the much-touted voluntary program will likely not survive.

The chapters on biology and the "habitat mitigation plan" in Appendix B show only a superficial understanding of the value of the project site as a relic of undisturbed natural habitat, in an urban county where nearly every area has been substantially altered by man. Many of the proposed mitigation

measures are either inadequate, or could require mitigation for their impacts (such as the burn program).

24-5 Both primary (direct) and secondary (indirect) consequences should be considered in determining the significance of a project's environmental effect. The EIS fails to consider the potential economic effects on the existing businesses of the farm operators in Apanolio and Pilarcitos Canyons. For example, a reduction in summer flows in Apanolio Creek, or the potential migration of leachate off site, could adversely affect the water quality and quantity available to farm operations as well as domestic users. The potential economic consequences for existing business needs to be considered to the extent that potential is demonstrated to be an indirect environmental effect of the selected alternative. See Citizens for Quality Growth v. Mount Shasta (1988) 243 CR 727, 734.

SPECIFIC COMMENTS

24-6 Page 1-4, first full paragraph, states that the leachate collection system would allow controlled removal of leachate from the landfill. The EIS does not consider that the Sewer Authority Midcoastside's expanded plant will probably be the depot for this leachate. Disposal of leachate needs further analysis.

24-7 Mandatory recycling to extend the life span of each of the alternatives was not considered (see general comments above.)

24-8 Pages 1-8 and 9, Hydrology and Biology. The hydrology, water quality, biology and wildlife populations were measured in a drought year and therefore are not a true measure to determine the real impact of the project.

24-9 Pages 1-10 and 11, Transportation and Circulation, Air Quality, Noise, and Public Health and Safety. Impacts associated with the landfill would be reduced if mandatory recycling were implemented.

24-10 Discussion on pages 1-18 and 19 is not adequate as to transportation and circulation as the discussion only relates to the life span of each alternative which sidesteps the impacts. This failing is throughout the document.

24-11 Page 1-25 Under Corinda Los Trancos Canyon - Forefill, the statement is made that a supplemental EIR and possibly an EIS would be required to use this alternative. This indicates an incomplete analysis of the alternative in this EIS that is the purpose of the document to consider each alternative adequately. The same is true for the Nuff Canyon analysis.

24-12 [Page 2-3. An explanation as to why the eight landfills were closed would be valuable information in evaluating the sites for possible further use.]

24-13 [Page 2-8, second full paragraph regarding the "understanding that Apanolio Canyon would be the landfill area" needs further explanation such as who has the understanding and its significance.]

24-14 [Page 2-11, third full paragraph, states that the proposed action would "ultimately" destroy 3.43 acres of wetlands. This seems to need an explanation as to the meaning of ultimately.]

24-15 [Page 3-49. Operation. Waste Acceptance. The Corinda los Trancos landfill site currently accepts untreated sludge from the Sewer Authority Midcoastside. The EIS should describe the environmental effects of this material in the waste stream for the selected alternative.]

24-16 [On page 5-94, a statement is made that smaller capacity sites other than the proposed alternatives have not been identified and therefore comparison of the environmental impacts of these smaller facilities cannot be addressed at this time. The several smaller alternative sites within and without San Mateo County need to be identified and consideration given as to how they could have been modified by mitigating conditions. See Citizens of Coleta Valley v. Board of Supervisors (1988) 243 CR 339, 348.]

COMMENTS ON APPENDIX B - HABITAT MITIGATION PLAN

24-17 [The Wildlife and Fisheries Mitigation Plan (Appendix B) is inadequate. The EIS, page 5-95, recognizes the irreversible and permanent loss of riparian woodland, wetland, and upland ecosystems in a pristine and undisturbed state. The plan proposes a series of piecemeal manipulations of scattered wetlands, riparian systems, and uplands to attempt to "outweigh" in a numerical rating theory, the loss of these ecosystems.]

24-18 [Some of the manipulations are simply inappropriate, and will create impacts that are more severe than the benefits they purport to convey. One example is the burn program. The predominant upland plant community is northern coastal scrub, (variously referred to in Mitigation Plan as coastal scrub brushland, chaparral and upland chaparral (sic). This community is found where summer fog maintains a relatively moist environment throughout the non-rainy season. These foggy conditions do not create a severe fire hazard. Very little is known about effects of manipulation of northern coastal scrub. We know of no literature on success of revegetation efforts, short and long term effects of fire, etc. The area covered by northern coastal scrub is steep, and subject to landslides. Yet a program of regular and repeated burning of 500 acres of this plant community is proposed. The burn program is justified variously as providing "improved wildlife habitat" (page 5 of

Osterling), ridding the area of "over-mature" brush (page 5 and 18 of Osterling), and reducing fire hazards (page 5-62). No analysis is done of the direct loss of wildlife due to repeated burning of 50 acres per year, on ten to fifteen year cycles. Rather the consultant concludes that "all upland wildlife species will benefit from the prescribed burning program". There is no discussion of erosion, sedimentation, and landsliding that may occur as a result of denuding slopes. We suggest this burn program be deleted entirely.]

24-19 [The proposed grassland development on the landfill face (page 20 of Osterling) should be either eliminated or changed to use only indigenous (native) grasses that would be found in similar coastal slopes. Better yet, the landfill face revegetation should use plants that are native to the site. Success of such revegetation may be questionable due to the lack of knowledge about how to create a northern coastal scrub community. The riparian areas would be obviously not replaced on the landfill face.]

24-20 [The water temperature moderation plan (Osterling, page 21) proposes to plant ceanothus along the length of a 1500 foot concrete drainage channel, and then proposes that this new habitat has a high wildlife habitat value of 7. We would like to know just how the consultant found that waterfowl shorebirds, wading birds, song birds, reptiles, small mammals, and amphibians all would find a concrete drainage channel with ceanothus shading it to have a high habitat rating of 7 or 8.]

24-21 [Mitigation for the loss of 3.676 feet of perennial coldwater stream proposes a series of off-site projects. Some of these are designed to enable steelhead to more easily move upstream. We question whether the steelhead are going to be benefitted by being helped during low-flow periods, when they do not migrate anyway. We also question whether enabling them to swim up Pilarcitos Creek and Apanolio Creek in order to bump their noses against the toe of the landfill accomplishes much. What has been the experience in other steelhead streams when fish encounter a barrier such as a landfill that prevents their spawning in historical areas? Much of the mitigation plan, as proposed, depends upon areas not owned by the applicant. What assurances are there that any or all of these scattered projects are actually feasible? A mitigation plan needs to be devised that more directly compensates for the loss of habitat.]

24-22 [Welland restoration likewise depends upon disparate areas being created or enhanced in order to compensate for the loss of 3.43 acres of an integrated wetland ecosystem at Apanolio Canyon. We do not believe these scattered projects fully compensate for the habitat loss.]

ADDITIONAL MITIGATION MEASURES NEEDED

The DEIS, page 5-78 and 79, Land Use Plans and Policies, states that the proposed project would be compatible with the surrounding agricultural and open space lands, provided an adequate buffer zone were incorporated. No mitigation measures were required for this potential serious future conflict. We would suggest that the project applicant be required to place a permanent open space easement on the areas of the Ox Mountain Ranch where landfill is not proposed in order to assure that no incompatible uses are created, and that the landfill area is not expanded beyond the contemplated area of the proposed project.

Thank you for the opportunity to comment. We know that the Army Corps and other regulatory agencies have great concern over the long-term effects of landfills as methods of disposing of solid waste. We share this concern. We believe that source reduction, recycling, resource recovery, composting, and waste to energy facilities will eventually replace landfill as the preferred systems for disposal of solid waste. All but waste to energy facilities, which have significant air quality impacts, are possible to be used today. By permitting a 100 year landfill site for San Mateo County's solid waste, there is no incentive to implement other solutions. We ask the Army Corps of Engineers to include in any permit for this project strict standards with timetables for a strong waste reduction program.

Please notify us of your decision, and we would appreciate receiving a copy of the Final EIS.

Sincerely,

Lennie Roberts

Lennie Roberts
Legislative Advocate
Committee for Green Foothills
339 La Cuesta
Portola Valley, CA 94025

P.O. Box 490

Miss Beach, California 94034

July 23, 1988

Galen H. Yanagihara
Colonel, Corps of Engineers
San Francisco District, Corps of Engineers
Department of the Army
211 Main Street
San Francisco, CA 94105-1905

Dear Sir:

The DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE PROPOSED EXPANSION OF THE OX MOUNTAIN SANITARY LANDFILL (DEIS: Regulatory permit Application No. 16611S91) has serious inadequacies that will prevent decision makers from having information pertinent and necessary to a proper review of the project. In the following, I will confine my comments to ecological and biological aspects of the situation and will then close with a few more general issues.

1. GEOGRAPHY. The project site is an almost completely isolated pocket of nature. Downstream from the proposed landfill, the valley floor and low hillsides have been thoroughly disturbed by agriculture and buildings. The stream is impacted by impoundments. To the east is the Corinda Los Trancos landfill. To the west, the hillsides have been disturbed by agricultural operations and, over the ridge, the development of Half Moon Bay City. To the north, the high ridges provide a partial barrier, though there is some continuity with the plant communities in the Frenchman's Creek watershed. However, the virgin Douglas fir forest provides an isolating factor for the scrub communities below.

Isolation is one of the key ingredients in the development of unique life forms and in evaluating the potential for unique forms in a given area. In Apanolio Canyon much of the isolation has been caused by human endeavors; not enough time has passed for new species to evolve. Evolution is not the point here.

On the other hand, almost all watersheds draining to the ocean on the San Mateo County peninsula have undergone human disruption. This is especially true north of Highway 92 where watershed hillsides are dominated by northern coastal scrub rather than evergreen coniferous forests. Thus, the project site in its almost undisturbed condition represents a relic of a once more common situation. It may contain species that have been seriously impacted or eliminated elsewhere. This fact begs for particularly thorough surveys for rare or unique species of plants, animals, fungi, and other living things, for unusual microhabitats that are likely to contain rare organisms, and for unusual combinations of organisms such as rare plant communities. All of these unique situations are found in the same ridge complex on the slopes of Montara Mountain just a few miles to the north, yet only superficial and incomplete forays in search of natural entities have been made in Apanolio Canyon. A geographically isolated natural location in the heavily urbanized San Francisco Bay Area requires much more care.

2. ECOSYSTEM. It is well established in the general ecological literature that watersheds constitute a form of ecosystem--an interacting system of living and nonliving components. It is the property of such a system that an impact on one

(cont.)

(415) 726-6244

7BPS

Comments on DEIS for Apanolio Canyon Landfill

component will in turn affect other components. What happens to portions of the scrub-covered hillsides or the fir forests above may well affect the creek--and vice versa. Yet the DEIS avoids consideration of the effects impacts on one part of the ecosystem may have on another in almost all deliberations. Indeed, the watershed is never described as an intact natural ecosystem. Without representation of this perspective on the project site, decision makers are left without the matrix into which all artificial activities will be inserted. The DEIS makes no assessment of how much perturbation the various elements of the ecosystem can take without irreversible damage. Reviewers of the document are left without an assessment of cumulative impacts or even a means to decide whether or not such impacts will occur. The meristic DEIS considers only a select few biological components of the site in artificial isolation from one another.

3. VEGETATION. A proper survey of the vegetation of an area is a common starting point in coming to some general understanding of the natural (and, not incidentally, the life support) values of an area. In the DEIS, I have yet to discover a single reference to the name that the most frequently used authority (Barbour and Majors, THE VEGETATION OF CALIFORNIA, published in an updated version by the California Native Plant Society in 1987) would give to the vegetation type, which is "northern coastal scrub." In contrast, the DEIS presents a confused array of terms: scrub, coastal scrub, coastal sage scrub, coastal scrub chaparral, etc. How could a non-biologist with little familiarity with the site hope to know what kind of vegetation covers most of the area? Without such knowledge, how can proposed or overlooked mitigations be assessed?

Table B-1 in the DEIS (prepared by Thomas Reid Associates, 1984) appears to be a credible initial list of the plant species most commonly found in the area. However, most of the collections seem to have been done from access routes on the periphery of the proposed landfill site, and no data are given for the timing of the collections. The list is consistent with the streamside riparian habitat, the ridgetop and interspersed fir forest, and the northern coastal scrub that fill all but a small portion of the project area. No quantitative data are given for the various species in Table B-1, the only attempt in this direction being a subjective letter code for abundance in the areas visited. No vegetation mapping that is "ground-truthed" is presented with the information on plants in the DEIS. The only vegetation map that sneaks in--also prepared by Thomas Reid Associates (March, 1983)--shows up as Figure 1 in the marbled murrelet report in Appendix B. Seemingly, it was prepared only from a color aerial photo.

Thus, the information on vegetation needed to appraise this natural area is missing or incomplete. No information on plant associations is reported. Again with reference to the more thoroughly surveyed vegetation on Montara Mountain a few miles north, one is left to wonder what small, ephemeral springtime herbs have been overlooked. What small, unique plant communities might be found within the northern coastal scrub deep in Apanolio Canyon?

4. IMPORTANCE OF VEGETATION. Plant life is the most obvious and important biological feature of Apanolio Canyon, yet in the failure of the DEIS to assess it in a comprehensive manner, one suspects a deliberate effort to avoid the topic or presentation of salient features to decision makers.

As the aforementioned volume by Barbour and Majors will verify, there has never been a thorough investigation of the ecology of northern coastal scrub in a general sense, let alone the particular semi-isolated version found in Apanolio Canyon. Natural succession for this vegetation type remains undetermined. Unlike chaparral, no studies have been made of its fire ecology, if any. And so forth. (cont.)

This lack of knowledge on the plant ecology of northern coastal scrub is of crucial importance in considering all the biological sections and proposed mitigations for the scrub-covered hillsides in Apanolio Canyon. No studies are available to describe the recovery of this vegetation after mechanical disturbance or fire. I have been unable to discover a single report describing a successful artificial reestablishment of such vegetation after human disturbance. Several plant ecologists comment on the irony of this in the literature, inasmuch as northern coastal scrub was once the vegetation found on tens of thousands of acres now dominated by agricultural and urban development and covers many valuable sites now slated for development. One would think it deserves more attention from the botanical community and environmental consultants.

One is left to extrapolate from other kinds of vegetation or to get by on knowledge acquired on single species found within the scrub.

25-8

Consider a few of the natural and economic values of northern coastal scrub as it is found in its natural state in Apanolio Canyon:

- It is a stable, enduring vegetation type best adapted to the temperature, soils, moisture, and sunlight of the area. Where plant cover is desired, the scrub in its natural state will require the least human effort and expense and provide the most natural subsidies.
- Northern coastal scrub is the underlying source of food for all animal life found in it in nature and, by extension, for all decomposers natural to the area.
- Northern coastal scrub is the only known long-term protection against erosion on the steep coastal hillsides on which it is found. Empirical evidence from Old San Pedro Mountain Road across Montara Mountain, from hillsides south of Half Moon Bay cleared for flax production in World War II, and from numerous other mechanical intrusions on the coastside shows that about 90 percent of severe erosion and landsliding in such areas is associated with disruption of the continuous cover of scrub. The soil and underlying fractured and weathered granitic rock described in the geological sections of the DEIS are almost identical to those found in the most highly eroded hillsides on the northern San Mateo County coast, including areas on Montara Mountain where massive debris flows have been initiated by artificial intrusions. Yet severe erosion where northern coastal scrub has remained untouched is very rare. Obviously, a continuous covering of this vegetation type provides the cheapest possible natural subsidy for erosion control.
- Northern coastal scrub contains a high degree of species diversity, especially on north-facing slopes in this area. Although it is not a law, ecologists generally associate such diversity with stability, as no single species is entirely crucial to the whole.

e. Northern coastal scrub undoubtedly plays an important role in the hydrology of an area, although this role has not been scientifically scrutinized to the best of my knowledge. When fog touches the scrub, some of it condenses and drips to the understory plants and the soil below. This must play some part in the regeneration of groundwater. (It is amusing that many of the local coastal creeks shown as intermittent on USGS maps actually flow continuously, even in drought years.) Furthermore, the scrub and its associated soil absorb a huge amount of moisture during heavy rains. The central fork of Martin Creek above the crossing of the right-of-way property for the proposed Devil's Slide Bypass only increased to approximately double its average winter volume during the storm of mid-February, 1966. Its turbidity increased, but not to the point the stream bottom could not be seen. By the time the creek picked up several tributaries impacted by roads and agriculture, received runoff from its banks, and passed through the culvert under Highway 1, it was at least 10 times its normal volume and virtually opaque. This anecdote hints at the ability of the scrub to hold and slowly release rain-

(cont.)

fall and deserves a more quantitative inquiry. At the least, the situation in the natural watershed at the upper end of Apanolio Canyon must be similar, providing less turbid water for the aquatic life now found there, some degree of protection from flooding during storms, and a more paced release of water to downstream properties. All for "free."

f. As the natural covering of many coastal landforms, northern coastal scrub is associated with natural beauty for many people who enjoy the coastside. The attitude of the DEIS on this matter is "out of sight, out of mind." But because so much of this vegetation type has been artificially altered elsewhere, remaining natural areas become all the more valuable as relicts and as reference areas for information and "starter" organisms needed to repopulate other damaged sites. Therefore, any loss of ecosystems or vegetation types already much reduced elsewhere is a notable loss to our natural heritage.

When I lead hikes through scrub communities of the sort found here on the coastside, I find that some people become excited by the plant life in the course of a day. In the first place, scrub is full of wonderful smells, some of which rub off on the hikers' clothing. Later, people become aware of the complexity around them, a complexity that is much greater than is obvious on the floor of a more immediately awesome redwood forest. Sure, this is a subjective form of nature-loving, but it is meaningful to those who enjoy it.

The above comments concentrate on northern coastal scrub, and much more could be said about the rare remnant (for the midcoast area of San Mateo County) of natural riparian habitat. As much could be said about what is not known about the dynamics of this type of natural vegetation and the lack of knowledge about how to restore it to a natural condition.

And then there is the virgin stand of Douglas fir forest, which in the contiguous forest on Scarper Peak represents the northernmost reach of forest on the spine of the Santa Cruz Mountains. These trees undoubtedly trap water from the fog and play a role in the year-round water budget of the watershed. The small stands of trees surrounded by scrub on the lower slopes are in themselves biological islands for nonnative species and might well be investigated for their properties.

25-9

5. BIOLOGICAL DIVERSITY. Diversity, which is a measure of the variety and proportions of different kinds of organisms in an area or interacting assemblage, is an important biological property to be considered in any ecological discussion of the destiny of a natural area. Yet the DEIS does not confront this measurable aspect of the ecosystem or the aggregations of organisms in Apanolio Canyon in more than an offhand manner. It is as if those preparing the document have not heard of indices of diversity or how to acquire the data needed to calculate them. Another possibility is that such considerations have been avoided, whatever the case, indices of diversity are one means of relating the general biological value of one place with that of another.

A National Biological Diversity Conservation and Environmental Research Act (HR 4335) has now been introduced in the United States Congress. In cosponsoring the legislation, Claudine Schneider (R. RI) stated "the unchecked loss of biological diversity threatens all of us. By conserving biological diversity in the United States we can set an example that will establish us as leaders in the effort to avoid a global crisis." Even more appropriate to the situation in Apanolio Canyon were the words of cosponsor James Scheuer: "Existing laws try to save species one-by-one, after their habitats have shrunk and their ecosystems have been disrupted. Ultimately, this process is costly and ineffective. It is time to go beyond the ecological safety net afforded by existing laws, and to enact a

(cont.)

25-10

comprehensive bill which prevents species from becoming endangered in the first place."

Apanolio Canyon may contain an unusually high degree of biological diversity. The landscape is still largely in an undisturbed natural condition, free in most areas of artificial simplification through mechanical disturbance, spraying of toxic chemicals, or introduction of uncontrolled alien species that are outside the biological balances found in natural ecosystems.

Beyond its natural condition, Apanolio Canyon should have a high measure of diversity because it is a patchwork of different assemblages of organisms. This can readily be seen even in the general vegetation map prepared by Thomas Reid Associates in March, 1983. Patchy environments are almost always associated with a high degree of diversity. The islands of forest and riparian habitat surrounded by northern coastal scrub create many more meters of interface between vegetation types than if there were a single straight boundary between scrub and riparian and between scrub and forest. Interfaces bring different kinds of organisms in contact and are thus ripe areas for such evolutionarily significant processes as hybridization and natural selection.

Within the areas covered by the major vegetation types are varying conditions of moisture, light and shade, wind, soil, and other physical factors. Such conditions would be expected to produce varying assemblages such as differing plant communities within the vegetation, further increasing the diversity in the watershed.

Without a proper appraisal of diversity, an important aspect of the area's biological value that relates in a major way to the adequacy of proposed mitigations has not been considered. All that is found in the DEIS are several incomplete and questionable species lists that present insufficient data for any sort of respectable evaluation. The plant list is the best of these, but judging by the lists prepared for just a small portion of Montara Mountain to the north, one would expect to see many more small herbs in the understory (though not not necessarily the same ones). Table B-2 is grossly incomplete simply on the face of it. Has anyone at the Army Corps of Engineers wondered that not a single newt or lizard made it onto the list in this coastal area? With other large coastal watersheds housing a variety of raptors, some migratory, in the course of a year, has anyone questioned why only the red-tailed hawk is listed for Apanolio Canyon? How can there not be any mice at the project site? Does anyone believe one day in May (May 20, 1983) can provide more than a cursory listing of lepidopterans? And why are none of the other orders of insects, classes of arthropods, and phyla of invertebrates found in this canyon with seemingly so much to offer the occasional beetle or worm? Such a haphazard, careless survey of species is virtually worthless for a general appraisal of biological values. Let alone the discovery of rare, unique, or endangered organisms other than the few largest and most obvious possibilities. The sort of biological assessment found in the DEIS is the very sort that is stimulating HP 4335.

6. RARE AND ENDANGERED SPECIES. Rather than begin with thorough species surveys to discover what organisms and assemblages exist in Apanolio Canyon, the DEIS takes the approach of guessing what might be in the watershed, then explaining it away. This approach is, at best, hit-and-miss for the little known ecosystem being examined. It is not so much that the work and suppositions found on pages 4-56 through 4-62 of the document are in error as that so much that would be reasonable for this site is left undone.

Consider the Insect Report by Richard A. Arnold in Appendix B. Of the six species assigned to him, he is unable to reach a conclusion on two (Leach's Skyline diving beetle and Ricksecker's water scavenger beetle). Are these now to

(cont.)

be forgotten?

Dr. Arnold's logic concerning three endangered or potentially endangered butterflies appears to be correct. But more instructive is the fact he spent only one day in on-site inspections, and not all of that was spent in Apanolio Canyon. He could not possibly have covered the possibilities for rare insects in this diverse biological situation in that time. Furthermore, the day he visited, 22 September 1987, was at a poor time of year for coastal insect activity. Most lepidopteran activity is in the spring, for example. To draw general conclusions on possible rare and/or endangered insects from Dr. Arnold's report would be to jump over other possibilities to a conclusion.

Simply as a point of enlightenment, another aspect of Arnold's report may be of interest to decision makers. Note the very small areas from which the species he investigated are known. Does this make you wonder what may remain undiscovered in the mostly unsurveyed terrain of Apanolio Canyon?

7. MITIGATIONS. Given the incomplete and superficial nature of the biological assessment for Apanolio Canyon, it is no wonder the Habitat Mitigation Plan by Ralph Osterling Associates found in Appendix B of the DEIS is incomplete, only loosely related to the actual biological features of the project site, and inadequate for some of the few features it does address. To comment seriously on this mitigation plan would take more space than the plan itself, in the sense that shooting from the hip takes much less time than a careful aim.

a. One element of the mitigation plan that is most sweeping in scope and bizarre in formulation is the uplands burning program (see pages 17-20 and Tables A-11 and B-22 through B-25. See also Map D-3.). In the face of the fact that there is virtually no information on the plant ecology in the scientific literature, this proposal makes the unfounded and unsupported assertion that the "brushfields are now in an overmature condition" (page 18). Nowhere is the name for the vegetation type even approximated, but in Table B-24 we find the term "UPLAND CHAPPAREL" (sic). This leads me to guess the preparer of the plan is attempting to extrapolate from the fire ecology of chaparral to the hillsides above the landfill and adjacent watersheds. Thus, on a leap of faith from one kind of vegetation and ecosystem to another, the plan would burn 500 acres of almost pristine and virtually unstudied coastal vegetation. Map D-3 seems to indicate the potential ravages of the fires would not even be confined to Apanolio Canyon but would eventually extend over the ridges into the watershed of Frenchman's Creek and Corinda Los Trancos. Beyond the potential natural damage to a type of landscape for which the role of fire has never been documented, the burn program could be downright dangerous to the facilities of the landfill and to downstream areas because of the erosion it could foster. Runoff from burned areas would carry characteristically high sediment loads and would occur at an unnaturally high rate and volume. How could this situation not impact any remaining riparian habitat and the role of the hillsides in the water budget of the watershed. Debris flows originating in denuded areas could possibly overwhelm flow reduction ponds and sedimentation basins. No revegetation plan is proposed for burned areas and nothing is known about how natural succession might occur. No program is proposed for the alien plant species that would surely invade the exposed areas, as they currently do in all other extensively disturbed areas of northern coastal scrub. Such foreign species can only further retard or prevent the possibility of recovery of the general natural vegetation that is adapted to the watershed.

b. Even more could be said about the mitigations suggested for the natural riparian habitat that would be destroyed (but I won't). Incredibly, concern for the creek focuses on a single species of animal--Salmo gairdneri gairdneri. Nothing is said about aquatic invertebrates or riparian plant diversity. With only a few large species of riparian/wetland plants involved in the artificial revegetation program (see Table C-2) the recovery of any approximation of a natural

(cont.)

plant community would be left to chance. Again, no vigorous program for elimination of invasive alien species is offered, leading to a permanently disrupted condition in the time frame of human lifetimes. In short, onsite mitigations do not correspond to the riparian values destroyed.

Lack of respect for the natural riparian habitat now found on Bfl property is highlighted on page 15 with the proposal to place 25 weirs in undisturbed portions of Apanolio Creek--assuring that even stretches of the creek not destroyed mechanically will be disturbed! A series of pools for Salmo gairdneri is no more a natural habitat for the fish than the gorilla compound at the San Francisco zoo is a natural habitat for gorilla gorilla. Mitigations for ecosystem destruction cannot be properly based on the inputs needed to sustain or increase a single species.

Other offsite mitigations involving streams simply do not relate to the rare natural habitat that would be impacted by the project, even though some would at best marginally improve the severely damaged areas discussed. The preparer of the Habitat Mitigation Plan did not even consult with the organization that holds a grant for study of restoration and improvement of San Pedro Creek. Mitigation of offsite damage would be better assigned to those who caused or currently support it.

7. The Habitat Value Comparison Methodology presented in Appendix B is an entirely subjective evaluation contraption virtually unrelated by discussion or quantitative data to the biological specifics of Apanolio Canyon. As such, it is entirely subject to the orientation and opinions of the person assigning the numbers to the current situation or the hoped-for results of the mitigation plans. In short, these habitat values can be used to justify anything the evaluator wishes because they are not based on well researched or documented criteria. This whimsical rating system alone reduces the solidity of the assertions made for the mitigation plans to the status of dreams. Decision makers are not given a sound basis on which to rate the DEIS. Only by separating out a few species for artificial "prizes" (which may not have anything to do with the long-term success of their populations) can one assign higher habitat values to degraded, impacted landscapes than to undisturbed nature. It is this sort of rating system that leads persons concerned with the disappearing natural values of the United States to assert some wildlife managers are only interested in playing god to a small number of large vertebrates. The dangers of this sort of myopia to Apanolio Canyon should be obvious.

8. The "grasslands" proposed for the surface of the landfill may serve to retard erosion somewhat, but they have no mitigation value in a biological sense. The species suggested are not native to natural coastal prairies and bear no relation to the natural plant communities that would be covered by the landfill.

To this point I have barely scratched the surface of the biological aspects of the DEIS for the proposed landfill in Apanolio Canyon. In failing to survey and describe the ecosystem and its major constituents comprehensively and accurately, the document leaves those responsible for its review and possible approval with a mixed bag of information. Without a sound scientific and factual basis, the proposed mitigations bear little relation to the actual biota to be impacted. From a biological standpoint, the DEIS is a weak piece of work.

Time does not allow me to comment on a number of other concerns raised by the DEIS. No mention is made of the Bay Area Ridge Trail that may run through San Francisco Watershed land on the ridge above Apanolio Canyon. Similarly, Frenchman's Creek Road to the top of Scarver's Peak is ignored, even though it would be the obvious access route to the lands on the ridge from Half Moon Bay. Should the S.F. watershed lands ever be opened in some way for recreation under the auspices of the Golden Gate National Recreation Area.

(cont.)

25-20 Citizens of San Mateo County also have reason to be concerned over where the garbage for the proposed landfill would originate. Just a few short months before the Army Corps of Engineers requested the environmental review now taking place, the supervisors of San Mateo County were courting garbage from San Francisco and elsewhere. One said, "There's money in garbage" according to a quote in a newspaper. All estimates for the longevity of the proposed and alternative landfills would become hopelessly erroneous if garbage from outside the county was trucked to the landfill, yet I cannot find a prohibition of this anywhere in the proposal for the project.

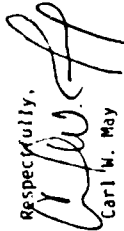
25-21 Similarly, Bfl lands in the greater Frenchman's Creek watershed are said to be a buffer, but this notion is not cemented anywhere. One might expect a conservation easement to be assigned to a responsible outside party such as the GGNRA if Bfl is being honest about the destiny of these lands.

25-22 Finally, the alternatives to the proposed project in Apanolio Canyon seem to have been written to self destruct during a reading of the DEIS. Even simple ideas that come to mind such as a combination of the smaller Corinda Los Francos Forefill and Muff Canyon Landfill are not considered. For Muff Canyon, I find no consideration of the possibility of a landfill in the area already quarried. Would there be any possibility of filling behind the quarry as it digs away the canyon?

25-23 Why is a severe recycling plan not among the considerations in the alternatives? Recycling cannot eliminate all solid waste, but it may certainly have profound effects on the design and economics of disposal schemes.

Thank you for considering the above.

Respectfully,



Carl W. May

CALIFORNIA TROUT



A FRIEND OF THE STREAM

July 25, 1988

Colonel Galen H. Yanagihara
District Engineer
US Army Corps of Engineers
211 Main Street
San Francisco, CA 94105-1905

Re: Regulatory Permit Application No. 16611591, Apanolio Canyon
Expansion Site

Dear Colonel Yanagihara:

We have reviewed the DEIS on Apanolio Canyon and after careful evaluation of the evidence presented in the DEIS along with a great deal of evidence not presented in the DEIS we are prepared to offer specific comments on the DEIS.

California Trout is a state wide organization of trout anglers and angling clubs dedicated to the protection and restoration of wild trout, native steelhead, and their habitat. It is the stated policy of the California Department of Fish and Game to preserve and enhance all remaining steelhead streams in California. Steelhead populations today are at one third their historic numbers, and steelhead habitat has been disappearing at an alarming rate. Apanolio Creek, in San Mateo County is one of the few remaining stretches of pristine steelhead habitat in California, and it is certainly one of the Bay Area's ecological treasures. For these reasons we are especially concerned about the future of Apanolio Creek.

We believe that the DEIS on Apanolio Creek is seriously deficient in a number of areas, and are deeply concerned that in the areas requiring careful scientific study and evaluation the DEIS is sketchy, evasive, and selective in its inclusion of factual evidence. The DEIS appears to us to be a document that is governed by the interests of the applicant, Browning-Ferris Industries, and as such violates the guidelines on preparing EIS's set down in the Code of Federal Regulations. The DEIS on Apanolio Canyon falls woefully short of the goal of a proper EIS. It is biased when it should be impartial, it is misleading when it should be informative, it is arbitrary in its methodology when it should be scientific.

We strongly encourage the Army Corps of Engineers to review the DEIS with the most rigorous form of criticism possible, and we believe that our specific comments on the DEIS on Apanolio Creek will aid USAF in judging the merits on the DEIS.

U.S. ARMY CORPS OF ENGINEERS
SAN FRANCISCO, CA 94105-1905

26 JUL 1988

We thank the US Army Corps of Engineers for this opportunity to comment on the DEIS. If we can be of further assistance during the revision of the EIS, please contact James Hamilton (415-731-1760.)

Sincerely,

James Hamilton
James Hamilton
Project Coordinator

26-1

26-2

26 JUL 1988

SPECIFIC COMMENTS CALIFORNIA TROUT ON DEIS.

OX MOUNTAIN SANITARY LANDFILL

APANOLIO CANYON EXPANSION SITE

1. Paternity of salmonids in Apanolio Creek.

DEIS is inconsistent in its identification of salmonid population(s) in Apanolio Creek. DEIS states in one place that the salmonid population on the applicant's land is "resident rainbow trout" (5-27), and elsewhere (4-53) quotes the CDFG in saying that the fish are "essentially residualized steelhead and rainbow trout." (Cf. also 5-28) To confuse further the issue regarding the paternity of the salmonids in Apanolio Creek, the mitigation section of the DEIS consistently identifies the salmonids in Apanolio Creek as *Salmo gairdneri*, which is the scientific name for steelhead (Appendix B, 11-14.) The FEIS should resolve this state of contradiction regarding the paternity of the salmonids in Apanolio Creek.

26-3

Neither the DEIS nor the mitigation section of the DEIS cite scientific evidence to establish the paternity of the salmonids in Apanolio Creek. For example, no electrophoretic analyses on the salmonid populations are referred to in the DEIS. The examination of the salmonids in Apanolio Creek as it appears in the mitigation section fails to give the age(s) of the salmonids caught and measured. Consequently, the statement that "the limiting factor on the number and size of fish in this area is cover and shelter" (p.13) appears to be not so much an oversight, but a suppression of factual evidence gathered by the CDFG in electrofishing surveys mentioned in the DEIS. It is clear from the information gathered by the CDFG in these surveys that the size of the fish in Apanolio Creek is due to their age. Virtually all the fish caught by the CDFG in their electrofishing surveys were 0 to 1 year old. (Steelhead smolt between 0 and 4 years of age. Shapovalov & Taft, 1954, p. 158; Fry, 1973, p. 60.) The lack of older, and consequently larger salmonids in Apanolio Creek strongly suggests that the salmonids in Apanolio Creek are juvenile anadromous steelhead (*Salmo gairdneri* Richardson 1836.) The FEIS should include this hypothesis in its identification of the salmonids in Apanolio Creek.

26-4

The DEIS states that steelhead cannot access 8,448 linear feet of upstream habitat "except possibly under extreme flood conditions" (4-53) and thereby attempts to impute that salmonid populations above the mentioned but unidentified "barrier" are rainbow trout. Given the length of the upstream portion of the stream we surmise that this barrier is the lower Bongard dam. The DEIS does not provide measurements of this structure. The FEIS should identify this structure and give its dimensions.

26-5

26-6

We have examined all three dams on Apanolio Creek - the lower and upper Bongard dams and the concrete and flashboard dam on Gil Gossett's property - and are certain none of these structures will impede steelhead migration. The lower Bongard dam, the highest of the dams, rises less than six feet above the streambed. Steelhead are known to leap 6 to 10 feet over falls (Evans & Johnston, 1974).

Phil Williams and Associates (1987) investigated the hydrology of Apanolio Creek during a flood event in February, 1986 and recorded a peak discharge of 225 cfs with an estimated flow depth of 3 to 5 feet at the lower Bongard dam. This flow depth, which would have produced falls over the dam between 1 and three feet in height, would permit steelhead migration quite easily. As indicated in the DEIS (4-27) table 4-2-3, Hydrocomp (1988) estimates that a two year flood event would produce a peak discharge of 235 cfs at the applicant's property line. These data suggest that steelhead migration is not only likely in Apanolio Creek, but also that it occurs far more frequently than "under extreme flood conditions." The FEIS should address this point.

26-7

Conclusion regarding paternity of salmonid population in Apanolio Creek:

The evidence gathered from electro fishing suggests that salmonid population in Apanolio Creek is juvenile steelhead. There is no evidence that steelhead cannot migrate up Apanolio Creek to its headwaters well above the toe of the proposed landfill in Apanolio Canyon. We therefore conclude that the salmonid population in Apanolio Creek is made up primarily of anadromous steelhead.

2. Aquatic Invertebrate Populations in Apanolio Creek and Terrestrial Invertebrate Populations in Riparian Corridor.

The DEIS does not include a study of the aquatic invertebrate population, the main food source for juvenile steelhead, in Apanolio Creek. The FEIS should include a study of the aquatic invertebrate populations along with a study of terrestrial invertebrate populations that are a food source to juvenile steelhead in Apanolio Creek.

Any discussion of mitigation measures is meaningless without an assessment of the likely impact of the proposed landfill in Apanolio Canyon on the aquatic and riparian invertebrate populations which make up juvenile steelhead diet.

26-8

3. Relation of Invertebrate Populations to Alder Forest in Apanolio Canyon.

26-9

The DEIS does not include a study of the relationship between aquatic and terrestrial invertebrates found in Apanolio Creek and its riparian corridor and the alder forest surrounding and shading Apanolio Creek. It is well known that invertebrates in riparian systems depend on detritus from decomposing vegetation, in this case, the leaf-fall from the red alders, as a primary food source. Since the greatest portion of the red alder woodlands lies above the toe of the proposed landfill, the removal of these woodlands will have a severe, possibly devastating impact on remaining downstream invertebrate populations. The FEIS should include a study of the relationship of invertebrate populations to the existing riparian forest along Apanolio Creek.

As stated in point 2, any discussion of mitigation measures is meaningless without an assessment of the relationship between invertebrate populations and the riparian forests in Apanolio Canyon.

4. Water Quality and Quantity.

26-10

The DEIS does not include a study of specific water requirements for juvenile steelhead habitat, i.e., temperature, turbidity, oxygen levels, flow, etc. The FEIS should include a study of these requirements and, based on the information, assess the impact of the proposed landfill on these specific aspects of water quality.

26-11

The DEIS states that summer flows would be reduced 40% (5-11). The FEIS should evaluate the impact that reduced summer flows will have on the water temperature, oxygen levels and availability of cover for a steelhead nursery in Apanolio Creek. The removal of the red alder forest with its sheltering canopy upstream of the toe of the proposed landfill will most likely occasion an increase in water temperature downstream of the proposed fill. The FEIS should investigate the impact that the loss of the alder forest will have on water quality.

5. Comparison of Proposed Project with Similar Existing Projects.

26-12

The DEIS does not offer an example of an existing landfill in a riparian ecosystem similar to Apanolio Canyon. The claims made in the DEIS that the landfill design will protect water quality (1-8) is not substantiated.

26-13

We concur with the comments made by Meredith/Boli Associates (June 28, 1988) on WATER QUALITY AND QUANTITY IMPACTS and LAND-FILL DESIGN (pp. 10-16) and herewith by reference incorporate them in our comments.

6. MITIGATION

26-14

The habitat value comparison methodology in the mitigation section of the DEIS is wholly unacceptable as a tool for evaluating the condition of the existing riparian and steelhead habitat and the projected riparian and steelhead habitat downstream of the proposed landfill. Because the mitigation plan of the DEIS is governed by assumptions made in the habitat value comparison the mitigation plan of the DEIS as a whole is unreliable for purposes of making decisions on the proposed landfill in Apanolio Canyon.

a. The methodology is itself arbitrary or, in the words of Theodore Wooster of the CDFG (attached letter of May 5, 1988), it is "subjective"; the methodology used is not justified in any scientific manner, nor is it referenced from any similar study.

b. There is no explanation why a certain numerical value was given to a specific element in the riparian / steelhead habitat, e.g., spawning gravels - i.e., why are the spawning gravels of Apanolio Creek on the applicant's property given a value of 3? How was this value derived? By comparison with what similar stream was this value derived? etc.

c. Numerical values are given to certain elements of the riparian and steelhead habitat which are not even studied in the DEIS, e.g. food production.

d. The habitat value comparison of the mitigation section basically contradicts statements made in the main body of the DEIS: specifically, the habitat values given to the steelhead and riparian habitat fall in the range of "poor" to "fair" (terms used in Ralph Osterling's mitigation plan) while the main body of the DEIS states that "the site currently has high biological diversity and wildlife value due to its remoteness and relative lack of disturbance." (5-25, emphasis added)

The habitat value comparison provided in the mitigation section of the DEIS appears to us to be a calculated deception which would substitute rigorous analysis based on scientific method with qualitative judgements that are governed by an interest in the proposed project. We therefore recommend that the mitigation section of the DEIS be stricken from the FEIS and that the Army Corps of Engineers direct RFI to conduct a new mitigation analysis that is scientifically sound.

26-15

We concur with the comments made by Meredith/Boli Associates (June 28, 1988) on MITIGATION PLAN (pp.7-9) and herewith by reference incorporate them in our comments.

7. ALTERNATIVES ANALYSIS

According to Section 1502.2(g) of the Code of Federal Regulations, "Environmental Impact Statement", an EIS "... shall serve as the means of assessing the environmental impact of proposed agency decisions, rather than justifying decisions already made." It appears to us that the DEIS is governed by a interest in the "preferred alternative" (i.e. 1200 foot fill of Apanolio Canyon), and that it does not adequately evaluate the alternatives included in the DEIS along with other reasonable alternatives not included in the DEIS. Because the DEIS in this matter violates the Code of Federal Regulations regarding EIS's, we recommend that the FEIS include a thorough study of alternative sites, including out of county sites, and that it weigh completely the relationship between the costs associated with all possible alternatives and the loss of the irreplaceable steelhead habitat and pristine riparian lands in Apanolio as is mandated by 40 CFR 1502.23.

REFERENCES

1. Code of Federal Regulations, Title 40, Part 1502, Council on Environmental Quality, "Environmental Impact Statement."
2. Evans, W.A. and F.B. Johnston. Fish Migration and Fish Passage. A practical guide to solving fish passage problems. U.S. Department of Agriculture, Forest Service Region 5 Report. 43 pp. plus appendices. San Francisco, 1974.
3. Fry, D.H., Jr. Anadromous Fishes of California. California Department of Fish and Game. Sacramento, 1973.
4. Shapovalov, L. and A.C. Taft. The life histories of the steelhead rainbow trout (*Salmo gairdneri*) and silver salmon (*Oncorhynchus kisutch*) with special reference to Waddell Creek, California, and recommendations regarding their management. California Department of Fish and Game Bulletin No. 98. Sacramento, 1974.

CALIFORNIA COASTAL COMMISSION

631 HOWARD STREET, 4TH FLOOR
SAN FRANCISCO, CA 94105
415 341555

CERTIFIED DEPARTMENTAL CORRESPONDENCE



July 22, 1988

Barney Opton
Environmental Branch
Department of the Army
San Francisco District, Corps of Engineers
211 Main Street
San Francisco, CA 94105-1905

RE: Comments on EIS for Ox Mountain sanitary land fill

Dear Mr. Opton:

The Commission has received the draft Environmental Impact Statement (EIS) for the development of a sanitary land fill in Apollonio Canyon, San Mateo County. The Commission has previously reviewed the proposed project through an amendment to the county's local coastal program (LCP) and through an appeal of the local government's coastal development permit. The Commission approved the LCP amendment, and found that the appeal did not raise any substantial issues and thus let the local government's decision stand. In those previous actions, the Commission reviewed the proposed project and its impacts, but mitigation, although required, was not a part of those reviews for as specific as it is here). Thus, the Commission staff's review of the EIS will not focus on the project's impacts or alternatives, but concentrate on the proposed mitigation for those impacts.

The EIS describes Apollonio Canyon as a remote and relatively undisturbed area that has "high biological diversity and wildlife value." Specifically, the wetlands and riparian resources of this canyon are extremely valuable, and impacts to these resources must be fully mitigated. However, the EIS does not include sufficient information to conclude that the impacts to the aquatic habitats will be completely mitigated. The plan does not include a discussion of the quality of the existing habitat at the mitigation sites. If these areas have existing habitat value, then mitigation on these sites may not be appropriate or they might not result in one-to-one mitigation ratio. The mitigation plan should include more detailed information regarding hydrological and biological restoration measures to be undertaken.

The mitigation plan describes the value of the habitats through a procedure called "habitat value units" (HVVU). The process for calculating the HVVUs is not completely described in the restoration plan. How is the habitat value for each species determined? The draft EIS (Appendix B) indicates a system with broad discretion and low precision. Is there a formula for calculating this figure, which improves this system and reduces the room for arbitrary values? The assumptions and margin of error used in calculating the HVVU should be made explicit. Without this information, it is impossible to evaluate the accuracy of the HVVU as a tool to guide mitigation.

27-1

27-2

PAGE 2
Barney Opton
July 22, 1988

27-3

The mitigation plan includes provisions for monitoring the results of the restoration efforts for five years after the completion of the mitigation projects. In addition, BFI will prepare a corporate guarantee in the amount of \$350,000 to insure the effectiveness of the mitigation program. If the mitigation program is not determined to be effective within five years, will the corporate guarantee continue to be available, and will BFI continue to monitor the restoration areas until the habitat areas have been determined to be fully restored? The EIS states that after completion of the restoration project and monitoring confirms full effectiveness of the mitigation, BFI will be relieved of further responsibility. The EIS does not discuss long-term protection of the mitigation sites. Since the proposed project will result in the permanent loss of relatively pristine habitat, the mitigation plan should include permanent preservation of the restored areas.

27-4

As stated above, the Commission has reviewed the proposed land fill on two separate occasions, and is in the process of determining whether to review the project through the federal consistency process, triggered by the issuance of a 404 permit by the Corps of Engineers. Since consistency review of projects where a coastal development permit has been issued by the local government is optional, the Commission staff believes that consistency review of this project will be necessary only if any issues have substantially changed or new issues have developed since the previous Commission review and if these issues remain unresolved. Commission staff does not believe that the mitigation plan is now developed in sufficient detail to determine its adequacy, and without modifications to this plan, the Commission may require further consistency review. If you have any questions, please contact Jim Raives of my staff.

Sincerely,

STEVEN F. SCHOLL
Assistant Deputy Director

cc: Ed Brown

BFI

HWQLE, San Francisco Bay Region

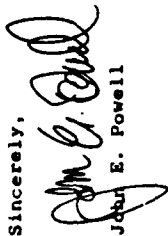
Col. Galen H. Yanagihara

Page 2

tion. Building an incineration facility would be costly, but certainly not as costly as destroying part of our environment.

In closing, I would like to say that having attended the July 7, meeting in Redwood City, I was pleased to see the attention afforded each speaker. Although some speakers were certainly more eloquent than others, I hope the Army Corps of Engineers will be able to separate the wheat from the chaff and continue to protect the interests of both the community and the environment.

Sincerely,


John E. Powell

JEP:lp

John E. Powell
1591 Kingswood Drive
Hillsborough, CA 94010
July 18, 1988

Col. Galen H. Yanagihara
U.S. Army Corps of Engineers
Department of the Army
San Francisco District
211 Main Street
San Francisco, CA 94105-1905

Re: Application No. 16611591; DEIS for the Ox Mountain
Sanitary Landfill, Apanolio Canyon Expansion Site, Browning
Ferris Industries.

Dear Col. Yanagihara:

I am writing to express my concern regarding the project referred to above. I was raised in nearby Pilarcitos Canyon, a few miles from the Ox Mountain site, and can bring to this issue first-hand knowledge of the area's abundant flora and fauna. The area is home to a broad range of creatures including deer, o'possum, raccoon, fox and bobcat, all of which are being steadily pushed out of the San Francisco Peninsula in the face of both residential and commercial land development. Even more importantly, at imminent peril of this project is Apanolio Creek, whose viability as habitat for steelhead trout would certainly be destroyed.

28-1

Garbage disposal is an undeniable and, perhaps, unavoidable by-product of our society. Destroying what must be considered our collective heritage hardly seems to be the answer. I recall the promises made concerning leachate contaminating the area's ground water, when the Ox Mountain landfill site was originally approved. Certainly Browning Ferris Industries has made every effort to fulfill these promises, but there now seems to be evidence of leachate indeed contaminating the ground water. I find it difficult to believe that on a project of much greater magnitude, such as Apanolio Canyon, that there will be anything but larger amounts of escaped leachate.

28-2

It would seem unacceptable to irreversibly damage any more of the Bay Area's dwindling wetlands. I believe an interim short-term site should be utilized while investigating a more reasonable solution, such as garbage incineration.

28-3



American Fisheries Society

ORGANIC 1970 | INCORPORATED 1910

July 21, 1988

CALIFORNIA NEVADA CHAPTER

Colonel Galen H. Yanagihara
District Engineer
San Francisco District
Corps of Engineers
211 Main Street
San Francisco, CA 94105

Department of Biology
6000 J Street
Sacramento, 95819

Subject: Comments on the Draft Environmental Impact Statement
for the Proposed Ox Mountain Sanitary Landfill, Apanolio
Canyon Expansion Site

Dear Colonel Yanagihara:

The American Fisheries Society is an international organization
of professionals dedicated to the conservation, development and
wise management of North America's fishery resources. The
California-Nevada Chapter has over 400 active members residing in
California and Nevada.

We have reviewed the Draft Environmental Impact Statement (DEIS)
for the proposed Ox Mountain Sanitary Landfill, Apanolio Canyon
Expansion Site in San Mateo County. We also consulted with other
fishery biologists experienced with steelhead trout biology in
developing these comments.

The preferred project will result in the filling of 20% of the
Apanolio Creek watershed, a 40% reduction in summer stream flows,
loss of 4,795 linear feet of steelhead and resident trout
habitat, and an increase in turbidity (suspended clays) in lower
Apanolio and Pilarcitos Creeks. The Society considers this an
irreplaceable loss of a coastal stream ecosystem, and, in our
opinion, the DEIS blatantly underestimates the level and
significance of the adverse impacts of the project.

29-1

Although portions of the watershed are degraded, Apanolio Creek
provides the most valuable stream habitat from a fishery
standpoint of any of the streams in the watershed. Some of the
degradation has occurred recently as a result of unauthorized
activities, construction of two culverted stream crossings,
filling, and removal of riparian vegetation. Two of the five
remaining tributaries to Pilarcitos Creek have no steelhead trout
as a consequence of the existing landfill and quarry. Two
additional tributary streams, Madonna and Arroyo Leon Creeks, are
dewatered each summer as a consequence of water diversions, thus
they provide no summer rearing habitat for juvenile steelhead

29-2

trout. Only Albert Canyon and Apanolio Creeks remain as a usable
and enhanceable streams for steelhead in the Pilarcitos Creek
watershed as construction of Stone Dam on the mainstem eliminated
the other upper watershed tributaries. We therefore, find that
the adverse impacts to water quality and instream habitats
associated with the preferred alternative will result in further
significant and unacceptable declines to the steelhead trout
population in the Pilarcitos Creek watershed.

29-3

We further find that the stream ecosystem and associated
terrestrial riparian community provide highly significant
resource values and are essentially irreplaceable. Maintenance
of the adjoining riparian forest ecosystem is critical to the
continued function and integrity of the stream habitats, and
consequently, impacts to the adjoining terrestrial riparian
habitats should be considered essentially as impacts to the
stream.

29-4

We believe that although San Francisco garter snakes have not
been documented in the identified landfill areas, the project
will adversely affect this species by further degrading
downstream water quality and habitats that support the species,
its prey items, and additional areas that could be used as sites
for enhancement and recovery. We believe the Corps should
consider these aspects pursuant to the pertinent sections of the
Endangered Species Act, including those Sections directing all
Federal agencies to use their authorities in furtherance of the
purposes of the Act: Sections 2(c)(1) and 7(a)(1).

29-5

The proposed mitigation measures are obviously inadequate in
their piece-meal nature. Riparian plantings (as proposed in the
document) have a dismal record as a mitigation tool. Substantial
documentation exists demonstrating the ineffectiveness of this
approach as mitigation for impacts to riparian habitats
(references available upon request). We believe that
improvements in flows in the other drainages by correction of
barriers will not provide adequate mitigation for impacts to the
fishery in Apanolio Creek. Substantial additional effort would
be required in those drainages (e.g. restoration of substantial
segments of adjoining riparian habitat) before considering this
type of mitigation. Moreover, it likely would be many years
(>50) before conditions would approach those in Apanolio Creek,
and even then, they would never replace or compensate for the
resource values now present in Apanolio Creek.

Steelhead trout vs. resident trout

29-6

We would like to address the issue of steelhead trout versus
resident trout which has been raised in the DEIS and at public
meetings. After a comprehensive evaluation of all existing
fisheries data for Apanolio Creek, including the Department of
Fish and Game's results from surveys conducted in September,
1986, and March 1, 1988, we conclude that both "residualized"
(steelhead) trout and juvenile steelhead trout coexist in this
stream through the proposed project site. It is common to find
both resident and steelhead trout coexisting within the same
reaches in coastal streams of central California.

29-7

The DEIS conclusion that the occurrence of a 50 year old diversion dam on the lower section of Apanolio Creek would only pass fish during extreme flow events misleads the reader into thinking that the stream values to steelhead and fisheries in general, are insignificant above the dam. In the Department of Fish and Game's comment letter on the Corps Public Notice (DEIS, Appendix C), Ted Vande Sander, the Department's hydraulic engineer stated that a cascade of four to five feet of water depth might allow fish to move along the streambanks. According to Mitch Swanson, Senior Hydrologist with a private consulting firm, the storm event on or about February 18, 1986 resulted in flows of 225 cfs at this dam and that the peak flow would have resulted in a water depth of 3-5 feet over the dam. Information provided by Hydrocamp in the DEIS states that this flow would occur every two years. Consequently, we conclude that, while the dam is a partial barrier during certain periods, it does not significantly preclude adult steelhead passage or render insignificant the steelhead populations or habitat above the dam.

29-8

Similar types of barriers occur on many of the central coastal streams in California and State funds are presently being used to modify some of these to enhance fish passage in an effort to improve the steelhead fishery. Thus, we find that the apparently incomplete downstream barrier to migration does not support the conclusion that the loss of steelhead habitat above is insignificant. We find that the other alternatives presented in the DEIS bear additional consideration and closer examination. Expanding the existing landfill at Corinda de los Trancos with a serious effort by the County to implement a recycling program in our view would be a more reasonable alternative. However, we oppose the siting of any landfills in coastal streams which support important and/or significant fish and wildlife habitats.

29-9

29-10

The American Fisheries Society strongly recommends that the permit application for the filling of Apanolio Creek be denied. In addition we recommend that alternative landfill sites be investigated using fish and wildlife values as one of the important criteria for selection.

Sincerely,

Monty D. Kundaew
for Dr. C. David Vanicek
President, California-Nevada Chapter
American Fisheries Society

cc: California Sport Fishing Alliance
Urban Creeks Council
CalTrout

SIERRA CLUB

LOMA PRIETA CHAPTER

San Mateo, Santa Clara, San Benito Counties
Peninsula Conservation Center
2448 Watson Ct.
Palo Alto, CA 94303
415/494 9901



July 21, 1988

Colonel Galen H Yanagihara
% Dr. Barney Opton
District Engineer
U.S. Army Corp of Engineers
211 Main St.
San Francisco Ca 94105-1905

re Revised Comments on the draft Environmental Impact Statement for Ox Mountain Sanitary Landfill, Apanollo Canyon Expansion Site (Regulatory Permit Application no. 16611591)

Dear Colonel Yanagihara,

The Loma Prieta Chapter of the Sierra Club which has some 22,000 members (10,000 residing in San Mateo County) is pleased to have this opportunity to comment on the draft Environmental Impact Statement for the Ox Mountain Landfill Expansion into Apanollo Canyon

Sierra Club policy requires that landfills must be sited safely and must be preceded by an operational waste reduction program. We believe that siting costly new landfills is prudent only if every effort is made to extend the lifetime and safety of the landfill. We would expect a vigorous waste reduction program to be operational county-wide by the time Apanollo receives its first solid waste and would expect such a program to become part of the permitting process.

Regarding mitigation, we find the proposed fragmented mitigation within the Pitarctos Watershed to be marginal in both value and compensation for loss of wetlands and functional riparian habitat. We believe consideration should be given to an alternative, non-fragmented, permanent mitigation plan which permanently restores an equivalent ecosystem to compensate for the loss of Apanollo Canyon, a pristine and functional ecosystem

We have the following specific comments

ALTERNATIVE TECHNOLOGY

The draft EIS mentions that a 5% (29,000 tons) reduction in solid waste can be achieved by an anticipated curbside recycling program. It is unclear whether this is per year and how long this 5% reduction can be sustained. It is also unclear whether or not other waste reduction programs (composting, commercial, decreased packaging etc.) are being considered and the additional impact these programs will have on further waste reduction. These programs should be addressed as an addition to the recycling alternative. **THE IMPACT OF SUCH PROGRAMS ON LANDFILL LIFETIME AND SAFETY SHOULD BE EXAMINED.**

Since other cities in the Bay Area have waste reduction goals of 50% (ie San Jose, Berkeley) over the next 5 years, it is unclear why San Mateo County cannot achieve such a goal and further extend the lifetime and safety of the proposed landfills

Since the recycling program in San Mateo County is voluntary and not mandatory, there should be a discussion of incentives and disincentives to keep such a program operational during the lifetime of the landfill. This discussion should also contain possible mandatory policies which should be adopted by the county to facilitate further waste reduction as well as those policies which will extend the lifetime and safety of the landfill. Among mandatory measures to be discussed should be a waste reduction condition on the land use permit or on the solid waste facility contract

The compatibility of a mandatory waste reduction program with the current revised County Solid Waste Management Plan should be examined

ALTERNATIVE SITES

The analysis of alternative sites is incomplete. The analysis should have included discussion of the pros and cons of using regional, out-of-county sites. Under NEPA, such sites should be considered under the No Action alternative

30-5

The costing data used for comparison of alternative sites is too simplistic and does not include avoided costs due to waste reduction programs nor does it include actual environmental costs. These recalculated costs should be included in the draft EIS for a meaningful comparison among sites.

30-6

The draft EIS does not address advantages which may result from using several smaller landfills simultaneously or sequentially rather than using one large landfill. It is unclear (Section 5.15) whether additional sites have been identified and rejected or just not identified for comparative purposes. The impact of a serious waste reduction program should be considered in the discussion of the lifetime costs and feasibility of the alternative sites.

SAFETY

30-7

Concern was expressed by a member of the Los Angeles County Waste Management Department during a recent landfill tour in Southern California, that a 5 ft. deep clay liner may not be adequate for landfills with a large capacity and long lifetime. Apanolio Canyon has been estimated to have a lifetime of 93 years. In addition, there exists the potential for doubling that lifetime with a good mandatory waste reduction program.

Since the 5 ft. deep liner is a minimal depth required by law, there should be some discussion of the adequacies of a 5 ft. liner over the prolonged lifetime of the landfill.

MITIGATION

30-8

The fragmented mitigation program which has been proposed is inadequate. Completion of this project will result in the loss of both riparian habitat and wetland habitat.

To compensate for the loss of an ecosystem within Apanolio Canyon, the mitigation package proposed is a series of measures which enhance the degraded Apanolio Creek and upland habitat as well as the degraded tributaries of Pilarcitos Creek watershed.

Because of the existing practices of fills and excessive water diversions, the anadromous fish populations which do use the tributaries are having increased difficulty reproducing successfully. In fact these fish may not have successful spawnings in the near future, despite this proposed mitigation or any other fragmented mitigation program. The proposed mitigation program will do nothing to improve the existing problem and thus does not serve as meaningful mitigation.

30-9

Instead of a fragmented mitigation package within the Pilarcitos watershed, the draft EIS should address measures to restore the entire Pilarcitos watershed to a condition which will permit it to function as a complete ecosystem. As mitigation, this would substitute the loss of one ecosystem for the gain of another, a 1 TO 1 ECOSYSTEM VALUE EQUIVALENT.

30-10

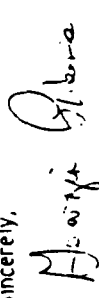
The alternative mitigation program should be examined in terms of measures to insure year round water availability, sediment control, stream habitat enhancement as well as measures (ie. formation of a watershed management district) to insure the permanence of the enhancement program for the Pilarcitos watershed.

30-11

Finally, the upland burn program should be addressed as a landfill management tool rather than mitigation. Such a practice would in itself need mitigating as the removal of the brush would result in increased erosion and resulting sedimentation.

We appreciate this opportunity to comment on the draft EIS for the Ox Mountain Apanolio Canyon expansion. Please do not hesitate to call upon us for further clarification of these comments.

Sincerely,


Georgia Perkins
Conservation Manager
Sierra Club, Loma Prieta Chapter



SIERRA CLUB

LOMA PRIETA CHAPTER
San Mateo, Santa Clara, San Benito Counties
Peninsula Conservation Center
2448 Watson Ct.
Palo Alto, CA 94303
415/494 9901

July 18, 1988

Colonel Galen H. Vanaghara
District Engineer
US Army Corp of Engineers
211 Main St.
San Francisco Ca 94105-1905

re Comments on Draft Environmental Impact Statement for Ox Mountain
Sanitary Landfill, Apollonio Canyon Expansion Site

Dear Colonel Vanaghara,

The Loma Prieta Chapter of the Sierra Club which has some 22,000 members (10,000 residing in San Mateo County) is pleased to have this opportunity to participate in the process of identifying the inadequacies of the Draft Environmental Impact Statement for the Ox Mountain Landfill Expansion into Apollonio Canyon

Sierra Club policy requires that landfills must be sited safely and must be preceded by an operational waste reduction program. We believe that siting costly new landfills is prudent only if every effort is made to extend the lifetime and safety of the landfill. We would expect a vigorous waste reduction program to be operational county-wide by the time Apollonio receives its first solid waste and would expect such a program to become part of the permitting process.

Regarding mitigation, we find the proposed fragmented mitigation to be marginal in both value and compensation for loss of wetlands and fish habitat from Apollonio Creek.

We have the following specific comments

-1-

ALTERNATIVE SITES

The analysis of alternative sites is not a complete one. Those included were not thoroughly addressed.

This analysis should have included discussion of the pros and cons of using regional, out-of-county sites. While such sites may or may not be feasible, under CEQA, they should have been considered fully under the No Action alternative.

The costing data used for comparison of alternative sites is too simplistic and does not include avoided costs due to waste reduction programs nor does it include actual environmental costs. The economic advantages of hauling distances with the various alternatives should also have been addressed. These costs should be included in the DEIS for a meaningful comparison between sites.

The DEIS does not address advantages which may result from using several smaller landfills simultaneously or sequentially rather than using one large landfill. It is unclear (Section 5.15) whether additional sites have been identified and rejected or just not identified for comparative purposes. The impact of a serious waste reduction program should be considered in the discussion of the lifetime costs of the alternatives.

ALTERNATIVE TECHNOLOGY

The DEIS mentions that a 5% (29,000 tons) reduction in solid waste can be achieved by an anticipated curbside recycling program. It is unclear how long this 5% reduction can be sustained. Is it yearly or a five year estimate? It is also unclear whether or not other waste reduction programs (composting, commercial, decreased packaging etc.) are being considered and the additional impact these programs will have on further waste reduction. These programs should be addressed as an alternative to or addition to the recycling alternative. The impact of such programs on landfill lifetime, safety and cost of garbage collection should be examined.

A maximum feasible recycling program alternative which includes source separation, composting, mechanical processing etc. should also be examined economically.

-2-

Since other cities in the Bay Area have waste reduction goals of 50% (San Jose, Marin, Berkeley) over the next 5 years, it is unclear why San Mateo County cannot achieve such a goal.

Since the recycling program in San Mateo County is voluntary and not mandatory, there should be a discussion of incentives and disincentives to keep such a program operational during the lifetime of the landfill. This discussion should also contain possible mandatory policies which should be adopted by the county to facilitate further waste reduction as well as those policies which will extend the lifetime, safety and costs of the landfill.

Other mandatory measures which may be needed also should be discussed. Foremost is a waste reduction condition on the land use permit or on the solid waste facility contract.

The compatibility of a mandatory waste reduction program with the current revised County Solid Waste Management Plan should be examined.

SAFETY

Concern was expressed by a member of the Los Angeles County Waste Management Department that a 5 ft deep clay liner may not be adequate for landfills with large capacity and long lifetimes. Apanollo Canyon has been estimated to have a lifetime of 93 years. In addition, there exists the potential for doubling or more that lifetime with a good mandatory waste reduction program.

Since the 5 ft deep liner is a minimal depth by law, there should be some discussion of the adequacies of a 5 ft liner over the lifetime and prolonged lifetime of the landfill.

SHORT TERM VS. LONG TERM PRODUCTIVITY

An analysis of a maximum feasible waste reduction program on the lifetime of the landfill needs to be included.

MITIGATION

The fragmented mitigation program which has been proposed is totally inadequate. Completion of this project will result in the loss of both riparian habitat and wetland habitat.

To compensate for the loss of an ecosystem within Apanollo Canyon, the mitigation package proposed is a series of measures which propose to enhance the degraded Apanollo Creek and upland habitat as well as the degraded tributaries of Pilarcitos Creek watershed. From the existing practices of fills and water diversions, the anadromous fish which do use the tributaries are having increased difficulties reproducing successfully. In fact these fish may not have successful spawning in the near future, despite the proposed mitigation or any other fragmented mitigation program. Therefore the proposed mitigation program will do nothing to improve the situation and therefore will not serve as viable mitigation.

Instead of a fragmented mitigation package within the Pilarcitos watershed, the DEIS should address measures to restore the entire watershed to conditions which will permit it to function as a complete ecosystem for anadromous fish. As mitigation, this would substitute the loss of one ecosystem for the gain of another, a 1 to 1 ecosystem value equivalent.

The program should be examined in terms of measures to insure year round water, sediment control, stream habitat enhancement and measures for formation of a watershed management district to insure continued maintenance and enhancement of the watershed.

The value of lost riparian habitat may not be equivalent to the value gained by the proposed created riparian habitat as outlined in the DEIS. The DEIS should address the adequacy of the 1 to 1 loss replacement concept due to value differentials and additional measures to increase this replacement ratio.

In addition, the value of the upland burn program seems to be questionable, and may actually result in increased erosion. As an alternative, there should be included some discussion of creating an open space buffer zone from the top of the landfill to the BFI property line.

We appreciate this opportunity to comment on the DEIS for the Apanollo Canyon landfill. We hope to see the issues we have raised addressed in the Final Environmental Impact Statement.

Sincerely,

Georgia Perkins
Conservation Manager
Sierra Club, Loma Prieta Chapter



Waste Management of North America, Inc.
Northern California District
2096 California Street, San Jose, CA 95131
Suite 400, Tel. 444-1444



Page 2
Colonel Yanagihara

July 18, 1988

Colonel Galen H. Yanagihara
District Engineer
US ARMY CORPS OF ENGINEERS
211 Main Street
San Francisco, California 94105-1905

Re: Comments on the Draft Environmental Impact Statement
- Ox Mountain Sanitary Landfill, Apanolio Canyon
Expansion Site, San Mateo County, California
(Regulatory Permit Application No. 16611S91) -

Dear Colonel Yanagihara:

Waste Management of California, Inc., takes exception to several statements that are contained in the draft EIS and that were made at the public hearing on July 7, 1988. Out-of-county alternatives have been dismissed summarily based on outdated information (e.g., an October 6, 1987 letter from the former President, San Mateo County Board of Supervisors) and on a biased, incomplete cost comparison (see page 3 - 10) of the draft EIS). Although the authors of the draft EIS claim that preliminary discussions have been commenced to formalize out-of-county options (see page 3 - 10), we are unaware of any such negotiations.

In our opinion, both short-term and long-term solutions to the solid waste disposal crisis that is forecast for San Mateo County are available. They include:
1) modifications to the existing Corinda Los Francos Canyon Landfill that also would correct environmental problems reported by the Toxic Assessment Group in its recent report to the California Assembly Office of Research and/or 2) out-of-county disposal at the Kirby Canyon or Newby Island Landfills. Both of these facilities either accept solid waste from beyond the boundaries of the City of San Jose or soon will (i.e., within months).

These types of practical solutions will provide the USACE and San Mateo County with sufficient time to evaluate thoroughly a potentially premature decision (i.e., the authorization of the Apanolio Canyon expansion) that will result in the irreversible destruction of valuable wetlands and stream habitat, as well as the long-term

degradation of high quality surface and groundwater resources. In the meantime, other non-wetland, non-trout fishery, non-endangered species habitat locations can be evaluated, planned, and constructed to provide the residents of San Mateo County with additional "in-county" waste management capacity.

Waste Management of California, Inc., would be pleased to assist San Mateo County and the USACE during the development of a timely, cost-effective, and environmentally acceptable solution. We look forward to interacting with you during the revision of the draft EIS.

Sincerely,

Gino Scopesi

Gino Scopesi
District Vice-President
Northern California District

GS/gkc

cc: Mary Griffin, County Board of Supervisors
Tom Huening, County Board of Supervisors
Anna Eshoo, County Board of Supervisors
Tom Nolan, County Board of Supervisors
William Schumacher, County Board of Supervisors

32-1

32-2

DRAFT

South Pacific Division comments on Draft Environmental Impact Statement, Ox Mountain Sanitary Landfill, Regulatory Permit

33-1

1. The notice in the Federal Register (8/18/87) (App. A), Paragraph 2C(2) states that alternative technologies including waste recycling and refuse to energy and other alternatives identified in the scoping process will be considered in the EIS. This has not been done. Incineration is becoming more economical and environmentally acceptable throughout the U.S. and worldwide and should be evaluated as an alternative to landfill disposal.

33-2/4

2. The reference to the Solid Waste Management and Recovery Act of 1972 should contain a citation.

3. Page 2-11. The reference to the Corps regulations should contain an appropriate citation.

4. Page 2-12. There should be a reference to the Corps responsibility under the Endangered Species Act, 16 USC 1531, et seq.

33-5

5. Under the 404(b)(1) guidelines, non-water dependent activities are presumed to have alternative sites. This report should contain a further explanation as to why no alternatives are available. The fact that an out-county site (page 3-16) may be impracticable or is more expensive is insufficient justification to not consider it further from an environmental standpoint. Likewise, the logic as to why the sites at Frenchman's Creek and Arroyo Leon were not further considered is unclear.

33-6

6. It is noted that the proposed landfill site is closer to Pillar Point than the proposed ocean disposal site designated as S-1. Care should therefore be taken to insure that the creek involved in the preferred alternative is not prime fishing habitat. See comments of EPA (Appendix A).

33-7

7. Page 3-1. List of Preparers. In the list of preparers include expertise, experience, professional discipline and role of the persons who were primarily responsible for the preparation of the EIS (ER 200-2-2, Page 1).

33-8

8. Page 3-39. The description of the collection system for the use of filter fabric surrounding the filter rock overlying the bedrock is not shown in Figure 3-5-7 as stated. Revise the figure to include the filter fabric.

33-9

9. Geology and soils information is rather skimpy:
a. Permeabilities of both soils and bedrock were not addressed and no on-site boring were noted. Base line conditions should be established better in order to approve any of these sites.

DRAFT

33-10 b. What is the life expectancy of the filter fabric? What will the effect of leachate be on the concrete and rebar in the underdrain system?

33-11 c. Page 3-43, middle paragraph. There should be groundwater monitoring wells downstream of the planned grout curtain.

33-12 d. Source of adequate intermediate and final earth cover should be addressed.

33-13 e. The EIS should address potential for acid leachate activity with grout.

DRAFT

DRAFT

July 25, 1988

Memorandum

To: The Honorable Gordon F. Van Vleet
Secretary for Resources
1416 Ninth Street
Sacramento, CA 95814

Attention: Gordon F. Snow, Ph.D.
Projects Coordinator

From: Department of Fish and Game

Subject: Draft Environmental Impact Statement (DEIS) for the U.S. Army Corps of Engineers Public Notice No. 16611591, Browning-Ferris Industries Landfill Near Half Moon Bay, San Mateo County, SCH 88061001

The Department of Fish and Game has reviewed the May 1988 DEIS for the Ox Mountain Sanitary Landfill Apanollo Canyon expansion site and we have the following comments:

The Department has been involved in the review of the project since December 9, 1983 when we commented on the Notice of Preparation of an EIR. Subsequently, we provided comments on the Notice of Preparation for a Supplemental EIR on November 18, 1986; the Supplemental DEIR on December 17, 1986; a letter from Ralph Osterling, Consultant to Browning-Ferris Industries on February 4, 1987; Corps Pre-Discharge Notification on February 26, 1987; and the Corps Public Notice No. 16611591 on July 7, 1987, which subsequently was forwarded to the Corps by the Resource Agency on July 9, 1987.

In addition, comments on drafts of the "Wildlife and Fisheries Mitigation Plan for Ox Mountain Sanitary Landfill Apanollo Canyon Expansion", were provided to the consultant by the Department's Region 3 staff on January 22, and May 5, 1988. The DEIS has provided us with additional information including an array of alternatives and as a result, we have additional comments and recommendations which should be addressed and resolved in any revised DEIS or FEIS.

The proposed Apanollo Canyon fill would provide the County of San Mateo with a major sanitary landfill with a conservatively estimated life expectancy of 93 years. The preferred alternative discussed by this DEIS would result in the loss of 4,272 linear feet of Apanollo Creek including 3,661 feet of stream which is known to contain a rainbow trout population which is most likely composed of both steelhead and resident subpopulations. The resident rainbow trout/steelhead juvenile population density was estimated at 1,502 juvenile/mile in September of 1986. Assuming that the 1986 sampling effort is representative of juvenile salmonid densities, we would expect the project to result

Resources Board
California Coastal Commission
California Tahoe Conservancy
California Waste Management Board
Colorado River Board
Energy Resources Conservation and Development Commission
San Francisco Bay Conservation and Development Commission
State Coastal Conservancy
State Lands Commission
State Reclamation Board
State Water Resources Control Board
Regional Water Quality Control Boards

GEORGE DLUMMEJ
GOVERNOR OF
CALIFORNIA



THE RESOURCES AGENCY OF CALIFORNIA
SACRAMENTO, CALIFORNIA

Resources Building
1416 Ninth Street
95814
(916) 445-5636
TDD (916) 324-0804
California Conservation Corps
Department of Boating and Waterways
Department of Conservation
Department of Fish and Game
Department of Forestry
Department of Parks and Recreation
Department of Water Resources

Colonel Galen Yanagihara
Corps of Engineers
ATTN: Barney Opton
211 Main Street
San Francisco, CA 94105

Dear Colonel Yanagihara:

The State has reviewed the Draft EIS, Ox Mountain Sanitary Landfill, Apanollo Canyon Expansion Site, San Mateo County, submitted through the Office of Planning and Research. We coordinated review with the California Highway Patrol, Waste Management Board, Coastal Commission, and the Departments of Fish and Game, Parks and Recreation, and Transportation.

The Department of Fish and Game and the Waste Management Board have prepared the attached comments for your consideration.

The Department of Parks and Recreation, Office of Historic Preservation, has already sent its comments to the Corps by letter of June 23, 1988.

The California Coastal Commission is preparing comments that it will send to you under separate cover.

Thank you for providing an opportunity to review this proposed project.

Sincerely,

Gordon F. Snow

Gordon F. Snow, Ph.D.
Assistant Secretary for Resources

Attachments (2)

cc: Office of Planning and Research
1400 Tenth Street
Sacramento, CA 95814

(SCH 88061001)

in the permanent loss of approximately 1,040 juvenile salmonids per year. Additionally, the preferred alternative would (according to Table 1.3-1) result in DEIS-estimated loss of 8-11 acres of riparian wetlands and 277 acres of upland consisting of a mixture of chaparral, scrub, and Douglas fir dominated forest.

For reasons which are more fully discussed below, the Department finds the subject DEIS to be inadequate in terms of its alternatives analysis, its assessment of biological impact, and its assessment of the adequacy of proposed mitigation. The Department recommends against certification of this DEIS until and unless the Corps completes its alternatives analysis and determines that the preferred alternative is superior for reasons other than environmental reasons.

Based upon information contained in the DEIS, it appears that the Corinda Los Trancos Canyon (forefill) alternative is less environmentally damaging than the preferred alternative. The Corinda Los Trancos Canyon alternative would allow the Corps, County, and other concerned agencies approximately two decades in which to attempt to avoid those more significant adverse impacts associated with this preferred alternative. Further, it appears that the rationale for selection of the preferred alternative over the Corinda Los Trancos Canyon alternative involves economic considerations. Should the Corps determine that the Corinda Los Trancos alternative is economically feasible, then the Department concludes that selection of the Corinda Los Trancos alternative over the preferred alternative would be consistent with both State and Federal law. Therefore, in the event that the Corps ultimately selects the preferred alternative, the FEIS should clearly specify the precise selection methodology employed by the Corps to support its conclusion that the preferred alternative is an environmentally acceptable alternative. The Corps should also respond to each of the issues which we raise in the attached detailed alternatives analysis.

The methodology which was utilized to identify values associated with existing biological resources in the preferred alternative area is inadequate. Similarly, this methodology has resulted in what we perceive as an overstatement of the biological value which would be produced through proposed mitigation. (These issues are treated in detail in the attached analysis under the heading "Biological Impact" and "Proposed Mitigation".) For these reasons, regardless of which alternative site may be selected by the Corps, and prior to the certification of this DEIS, we recommend that the Corps convene a technical advisory team composed of biologists from the U.S. Fish and Wildlife Service, the Department, the Environmental Protection Agency, and the National Marine Fisheries Service. This team should be charged with unanimously determining biological impacts which would result from the alternative selected by the Corps, and the team should be charged with unanimously determining appropriate compensation for biological impacts generated by the Corps-selected alternative.

The Department considers the identification of appropriate water quality standards to be the responsibility of the Regional Water Quality Control Board (RWQCB), and, for this reason, we choose not to provide detailed comments regarding water quality issues related to alternatives discussed in the DEIS. Rather, we will review and comment upon RWQCB findings regarding water quality issues, and will insist upon safeguards sufficient to result in no negative impacts to fish and other aquatic resources.

Lastly, should the Corps decide to permit either the Apanollo Canyon (1,200-foot) or any other alternative which results in the loss of sections of fish-bearing streams, such a choice must not be viewed as precedential for similar future projects.

We have divided the attached analysis into three distinct elements which discuss: I) Alternatives to the "Preferred Alternative"; II) Existing Fish and Wildlife Resources; and III) Proposed Mitigation. These comments are provided for the consideration of the Corps pursuant to the authority of the U.S. Fish and Wildlife Coordination Act, and in conjunction with the responsibilities of the Department as the State's primary fish and wildlife agency.

Should you have questions regarding either this letter or the attached analysis, please contact me at (916) 445-3531.

Pete Bontadelli
Pete Bontadelli
Director

Attachment

OX MOUNTAIN SANITARY LANDFILL EXPANSION SITE
 DETAILED COMMENTS REGARDING

I. Alternatives to the "Preferred Alternative"

The Department views the loss of a Department-measured 4,272 linear feet of Apanolio Creek (including 3,661 linear feet of stream occupied by resident rainbow trout and steelhead); a DEIS-estimated loss of 8-11 acres of riparian wetland; and the loss of 277 acres of upland habitat to be significant adverse environmental impacts which must, pursuant to the requirements of State and Federal law, be avoided, if feasible less environmentally damaging alternatives to the "preferred alternative" are found to exist. It is not the intent of the Department to obstruct a potential solution to San Mateo County's very real solid waste disposal problem. On the contrary, it is our intent to assist the County and the Corps in the identification of a solution to the County's solid waste disposal problem while simultaneously minimizing adverse impacts to fish and wildlife resources. Consequently, we recommend that the feasibility of all less environmentally damaging alternatives to the proposed Apanolio Canyon (1,200 foot) Sanitary Landfill be definitively determined.

Based upon the data presented in Tables 3.4-1 (as well as in the accompanying text), we conclude that the 1963 prospective sanitary landfill site selection process did not include impacts to fish and wildlife resources as a selection parameter. Further, based upon Table 3.4-2 (and the accompanying text) we conclude that the County's 1987 site evaluation did not qualitatively or quantitatively assess fish and wildlife resources which would be impacted by the various alternatives. We recommend that adverse impacts to fish and wildlife resources which would result from implementation of each potential alternative project mentioned in Tables 3.4-1 and 3.4-2 be disclosed. It is only through such disclosure that impacts to fish and wildlife resources may be minimized, and it is only through such disclosure that the least environmentally damaging feasibly implementable alternative solution to the County's solid waste disposal problem may be identified.

The rationale for rejection of several alternative sites mentioned in Tables 3.4-1 and 3.4-2 is insufficiently detailed to enable the Department to understand why these sites were rejected. Further, the rationale for the trend away from smaller sites and toward larger sites with a project life of 20 years or longer (as stated on page 3-9) appears to center upon the observation that more small landfills require increased permit review time and increased permitting effort. The observation that small fills "potentially increase impacts to . . . the natural environment" (page 3-9) should not be viewed as a foregone conclusion. In the case at hand we are dealing with an identified preferred alternative which may be far more environmentally damaging than the alternative

selection of several smaller sites. We again recommend that all prospective sites identified in the 1963 and 1987 studies be re-analyzed with regard to feasibility; that the analysis include a statement of the impacts of the various alternatives to fish and wildlife resources; and that the precise rationale for rejection of alternative be thoroughly and publicly disclosed.

Taking into consideration only those five primary alternatives discussed in this DEIS (i.e., Apanolio Canyon (1,200-foot); Apanolio Canyon (850-foot); Corinda Los Trancos Canyon (forefill); Huff Canyon; and "No Action") we were surprised to find that the Apanolio Creek (1,200-foot) alternative (the preferred alternative) would, according to the DEIS information contained in Table 1.3-1 and the accompanying text, result in greater environmental impact than the Corinda Los Trancos Canyon (forefill) alternative regarding "Geology, Soils and Seismicity"; "Biology"; "Transportation and Circulation"; "Air Quality"; "Noise"; "Public Health and Safety"; and "Public Facilities and Services" impact areas. The Corinda Los Trancos Canyon (forefill) alternative and the preferred alternative would (according to the DEIS) result in smaller impacts regarding "Hydrology and Water Quality"; and "Cultural Resources" impact areas. Lastly, the DEIS indicates that impacts of the Corinda Los Trancos (forefill) alternative exceed those of the preferred alternative regarding "Aesthetics"; "Plans and Policies"; and "Economics" impact areas.

Regarding the impact area "Aesthetics" (as listed in Table 1.3-1), in order to conclude that the preferred alternative is more aesthetically pleasing than the Corinda Los Trancos Canyon (forefill) alternative, one would have to conclude that the potential visibility of the Corinda Los Trancos site from the Half Moon Bay area is not at least offset by the fact that the Corinda Los Trancos site would impact 190 fewer acres of the "natural landscape". We believe that the loss of 190 acres of natural open space is far more aesthetically displeasing than is the possibility that the Corinda Los Trancos Canyon (forefill) alternative "may" be visible from the Half Moon Bay area. Therefore, we find that the Apanolio Canyon (1,200-foot) alternative would result in a greater impact than the Corinda Los Trancos alternative regarding the impact area "aesthetics".

Regarding the impact area "Plans and Policies", both the preferred alternative and the Corinda Los Trancos alternative conform with existing plans and policies. However, the DEIS indicates that an EIR and EIS would be necessary for the Corinda Los Trancos Canyon alternative and that the Corinda Los Trancos alternative would not meet the County objective for long-term disposal. In point of fact, and for reasons contained in this correspondence, the subject DEIS is inadequate, and, for practical purposes, preparation of a new DEIS should be required in order to comply with National Environmental Policy Act requirements regarding full public disclosure. Therefore, if the Corps honors the recommendation of the Department regarding the subject DEIS (i.e.,

34-9

34-10

34-11

34-12

34-7

34-8

that it not be certified), and taking into consideration the general similarity between an EIR and an EIS, there would be no measurable temporal difference between preparing an adequate DEIS for the Apanollo Canyon (1,200-foot alternative) and preparing an adequate EIR and EIS for the Corinda Los Trancos alternative. In fact, since the Corinda Los Trancos Canyon (forefill) alternative involves significantly less environmental impact than the Apanollo Canyon (1,200-foot) alternative, it may well be that certification of environmental documentation for the Corinda Los Trancos alternative could be achieved more rapidly. Therefore, we do not agree that the need to prepare environmental documentation for the Corinda Los Trancos (forefill) alternative can be viewed as a reason to select the preferred alternative.

34-12

Regarding the DEIS claim that the Corinda Los Trancos Canyon (forefill) alternative does not meet the County objective of long-term disposal, we find that this claim is not adequately supported by the DEIS. On page 3-9 the issue of "long-term disposal" is defined as disposal areas with a life expectancy in excess of 20 years. Referring again to Table 1.3-1, it may be seen that the Huff Canyon alternative (with a projected life expectancy of "27-years" (page 1-22)) "could meet the County goal for a long-term disposal site". Therefore, it is clear that the County goal of a long-term disposal site can be satisfied by identification of sites which provide more than 20 years storage capacity.

34-13

It could be argued that the 3 to 4 year discrepancy between the life expectancy of the Corinda Los Trancos alternative and the implied County definition of "long-term disposal site" is not significant, but we find that the discussion of "waste acceptance" on page 3-49 may render such arguments unnecessary. The discussion on page 3-49 indicates that the life expectancy of the primary alternative (and, we have determined, all other alternatives) was calculated by "assuming a 0.5 percent annual increase in solid waste requiring disposal". The very next sentence indicates that "waste reduction technology (e.g., recycling) is anticipated to reduce waste stream volume over the life-span of the proposed project". Therefore, a question arises - how do advances in waste reduction technology likely to occur over the next several decades effect the projected life expectancy of the various alternatives under consideration in the subject DEIS? The Department does not purport to be expert in answering this important question. However, if it is presumed that the waste reduction industry succeeds in reducing the annual volume of waste by one percent per year over the course of the next 16 years (which seems to be a conservative estimate) then the estimate of the life expectancy of Corinda Los Trancos Canyon would be somewhat in excess of the 20-year life expectancy required to satisfy the County's long-term waste disposal needs. Therefore, we reject the DEIS claim that the Corinda Los Trancos (forefill) alternative would not meet the needs of the County of San Mateo for a long-term disposal site.

34-14

Thus far, we have shown that none of the first 12 of the impact areas listed on Table 1.3-1 and discussed in the DEIS would result in selection of the preferred alternative over Corinda Los Trancos; and that the Corinda Los Trancos alternative may be shown to be superior to the preferred alternative regarding no fewer than 8 of the 12 impact areas analyzed by the DEIS.

34-15

It seems that the sole rationale for the selection of the preferred alternative involves economic considerations. The DEIS subdivides the economic feasibility discussion into two general elements: total project construction costs and cost per cubic yard of refuse. Inasmuch as the document indicates that the preferred alternative costs more to construct than the Corinda Los Trancos alternative, it follows that the sole justification for selection of the preferred alternative over the Corinda Los Trancos alternative must be the estimated construction cost per cubic yard storage capacity. The "cost per cubic yard of refuse" figures for Apanollo Canyon (1,200-foot) and Corinda Los Trancos Canyon do not include closing costs which are 17 million dollars for Apanollo Canyon and 5 million dollars for Corinda Los Trancos. Additionally, the claim contained in Table 5.12-1 (and further referenced in the text; that the site preparation of the Corinda Los Trancos alternative would be more than 10 times that for the preferred alternative (3.1 million to 33 million) is not documented in the DEIS. Further, the costs of increased public services associated with fire suppression, the increased costs associated with vector control, the costs of the increased risk of landslide in Apanollo Canyon, and the differential loss of fish and wildlife resources associated with the preferred alternative and the Corinda Los Trancos Canyon (forefill) have not been included in the comparative statement of "cost per cubic yard of refuse". Obviously, if these associated costs are included in an economic analysis, as we believe they should be, then the discrepancy in the "cost per cubic yard of refuse" would be significantly reduced.

34-16

For all of the reasons indicated above, based upon information contained in the DEIS, and because the Department is cognizant of San Mateo County's pressing waste disposal problems, we recommend selection of the Corinda Los Trancos alternative as the County's long-term disposal site. This site appears to provide the County with approximately two decades of time in which to consider its future waste disposal needs, and to arrive at decisions which would minimize adverse environmental impacts. Additionally, selection of the Corinda Los Trancos alternative would involve preparation of a detailed EIR and possibly an EIS, and the formulation of mitigation measures sufficient to offset adverse environmental impacts associated with the Corinda Los Trancos alternative.

34-17

In summary, it is significant that this DEIS does not indicate that any of the five primary alternatives discussed are

34-18

"infeasible". The Corinda Los Trancos Canyon (forefill) alternative, though somewhat more costly than the preferred alternative from the perspective of "cost per cubic yard of refuse", appears to be feasibly implementable and is definitely a less environmentally damaging alternative than the preferred alternative. Any finding by the Corps dealing with the feasibility of the Corinda Los Trancos (forefill) alternative as compared to the feasibility of the preferred alternative, must center upon the economic feasibility of the two alternatives since the Corinda Los Trancos alternative is superior to the preferred alternative taking into consideration the other "impact areas" discussed in the DEIS. In turn, any finding by the Corps that the Corinda Los Trancos (forefill) alternative is infeasible must definitively determine that the economics of this alternative are so as to render the construction and operation of this alternative impossible. The question of relative profits given selection of the Apanolio Canyon (1,200-foot) alternative or the Corinda Los Trancos alternative is a moot issue. The most important issue is whether the Corinda Los Trancos Canyon alternative constitutes a viable option taking into consideration the economics of this alternative. To the extent that the Corinda Los Trancos Canyon alternative is a viable option from an economic perspective, we believe that selection of this alternative over the "preferred alternative" by the Corps is mandated by the requirements of the National Environmental Policy Act and the Federal Clean Water Act.

II. Impacts to Biological Resources

These comments relate to the biological resources involved within and downstream from the Apanolio Canyon (1,200-foot) alternative (the "preferred" alternative), to adverse impacts to these resources which would result from implementation of the preferred alternative, and to identified inaccuracies and omissions related to biological resources. However, if the Corps selects the Corinda Los Trancos alternative, as we believe they should, then most of these issues become moot.

1. Pages 4-57-4-59: In the spring of 1988, the endangered San Francisco garter snake was documented to be present in the vicinity of the lagoon near the mouth of Pilarcitos Creek. The FEIS should develop a contingency plan to mitigate for adverse impacts to this species in the event that the "preferred alternative" results in adverse impacts to this species. The contingency plan should be reviewed and approved by the U.S. Fish and Wildlife Service and the Department prior to certification of the DEIS.

2. Page 4-53: The DEIS discussion indicates that the lower Bongard dam on Apanolio Creek prevents the upstream migration of steelhead "except possibly under extreme flood conditions". Steelhead are exceptionally adaptable fish and are capable of migrating past fairly formidable obstacles. Further, the

migratory pattern of steelhead is highly opportunistic, rapid, and coincides with appropriate stream flow.

A discharge of 225 cubic feet per second was determined (by Phil Williams and Associates) to result in a flow depth of three to five feet at the lower Bongard dam. Such a flow, in the opinion of the Department's hydraulic engineering expert and its unit biologist, appears to be sufficient to allow upstream migration of steelhead past Bongard dam, and, according to information contained in Table 4-2.3, a flow of 235 cfs would be expected to occur, on the average, once every two years. Therefore, it appears that steelhead are capable of using, and do use, the portion of the creek upstream from the lower Bongard dam on the average once every two years. Because of this recently developed information, we conclude that our past observation that fish found above the lower Bongard dam are "essentially residualized steelhead and rainbow trout" may have been in error.

For these reasons, the FEIS should acknowledge that it is highly likely that the rainbow trout population in the preferred alternative project area is composed of both resident and anadromous (steelhead) subpopulations.

3. Page 5-14: The DEIS states that a failure of the landfill's clay liner or leachate collection system is unlikely. Given the magnitude of impact to fish and wildlife resources which would result from such a failure, the Department requests that the DEIS definitively determine the likelihood of such a failure (i.e., the annual risk of failure). We take little solace from DEIS observations that "leachate contamination of the ground water would be limited if leachate spilled into the creek" and "migration of a leachate plume in ground water may not contaminate Apanolio Creek". The issue is the likelihood of contamination, and, using similar fills as a base line, the DEIS must state what that likelihood is likely to be. In order to comparatively evaluate the preferred alternative, and other potentially feasible alternatives, the issue of leachate contamination must be explored for each alternative under analysis, and the degree of risk involved for each alternative must be disclosed.

4. Page 5-23 and 5-25: The discussion of the magnitude of impact to wetlands is unclear. The Corps has made two determinations regarding its jurisdiction (approximately 11 acres and 3.43 acres). The consultants who prepared the FEIR determined riparian acreage to be eight acres. The subject DEIS claims the existence of 8-11 acres of riparian habitat. Prior to certification of the DEIS the Department strongly recommends the preparation of maps of the preferred alternative site, and all other potentially feasible alternative sites, detailing the vegetative communities and hydrologic regimes present on

all alternative site locations. Such maps, and a qualitative and quantitative statement of fish and wildlife habitat which would be impacted given implementation of the various alternatives under discussion, are of fundamental importance to a determination of relative biological impact. Such maps would also enable identification of precise impacts to wetlands resultant from implementation of the various alternatives.

34-22

5. Pages 5-27 to 5-29: The DEIS indicates that the trout population in the project area consists of resident rainbow trout. As previously indicated, the Department now believes that the trout population in the preferred alternative project area is composed of both resident and anadromous subpopulations.

34-23

6. A water quality contingency plan is discussed in several sections of the DEIS. Generally, this plan consists of a briefly described monitoring program and proposals to construct a second grout cutoff wall, and drawdown wells downstream from the proposed fill. The monitoring program should include both ground water and surface water stations, and the station location and number should be definitively stated. The monitoring program should include stations in lower Pilarcitos Creek since ground water recharge of the stream occurs in this sector.

34-24

7. Page 5-39: The relationship between increased garbage truck traffic on Highway 92, which would result from construction of the landfill, and the need to widen Highway 92, should be determined and disclosed by this DEIS.

34-25

III. Proposed Mitigation

The Department previously commented on mitigation measures which addressed impacts caused by a single project proposal at Apanollo Creek (Comments on Corps Public Notice 16611591, July 7, 1987, comments to the project consultant on January 22, 1988 and May 5, 1988). The following comments are provided in context with the array of project alternatives provided in the DEIS:

34-26

The best form of mitigation is impact avoidance. The next best form of mitigation is impact minimization with compensation for unavoidable impacts. For reasons explained in detail in our discussion of alternatives above, we believe that selection of the preferred alternative unnecessarily conflicts with the need to minimize adverse impacts. We believe that the selection of the Corinda Los Trancos alternative would be preferable to the preferred alternative from the point of view of biological impact avoidance and impact minimization. The following comments relate to identified problems with the biological mitigation proposed to offset the effects of the preferred alternative. These comments

34-27

are not intended to in any way detract from our previous finding that the Corinda Los Trancos alternative appears to be a feasibly implementable, less environmental damaging alternative than the preferred alternative.

34-27

1. Page 9 - Streambank vegetation

The conclusion that planted riparian vegetation would have wildlife value of seven (on a scale of 1 to 10) after three years is doubtful, especially when we take into consideration the fact that the consultants assessed the value of existing, established, and mature riparian vegetation in the project area as having a lesser value of six.

34-28

2. Pages 10 and 11 - Barrier Modification

The mitigation plan indicates that the applicant will correct a barrier to upstream fish migration on the downstream side of the Highway 92 bridge crossing over Pilarcitos Creek. This would normally be a desirable mitigation proposal. However, correction of this barrier will be accomplished by way of a streambed alteration agreement between the Department and Caltrans. For this reason we strongly recommend against inclusion of this barrier correction project as a mitigation measure for the preferred alternative.

34-29

3. Pages 11-14

For reasons previously stated, the Department now believes that the stream is populated by both resident rainbow trout and steelhead. The presence of essentially two cohorts in various sampling results, together with the previously indicated fact that two-year storm events generate flows of 235 cfs and are likely to permit upstream (and downstream) migration of steelhead, appear to demonstrate the probability that both resident rainbow trout and steelhead are present. The DEIS should indicate the presence of both resident rainbow trout and steelhead within the preferred alternative area.

34-30

4. Page 14-14

The habitat value rating of "4" for the Apanollo Creek trout population is not supported by an analysis of food, nursery, or spawning habitat. Therefore, it appears that this value rating is arbitrary, and we recommend that it not be used in the DEIS.

34-31

5. Pages 14-15, Barrier Modification

The improvement of low-flow barriers may be of little value to steelhead if their primary spawning habitat would be lost to

34-32

fill placement. Since no information regarding spawning areas is contained in the DEIS, the effect of the proposed barrier modification cannot be determined. Further, as is indicated in comment number 11 below, improvement of low-flow barriers would be of questionable value to steelhead.

34-32

6. Pages 156-16, Instream Structures

The impact of proposed instream structures on existing riparian habitat must be definitively determined by the DEIS, and compensation for unavoidable impacts must also be determined. Additionally, without identification of spawning habitat the efficiency of proposed instream rearing habitat improvement cannot be determined. If spawning habitat is substantially impacted by the preferred alternative, then the improvement of rearing habitat does not make much sense. Additionally, the predicted 40 percent reduction in summer flows would probably result in loss of any advantage gained by the proposed instream structures. Further, meaningful placement of instream structures can only be accomplished after the hydrological and substrate character of the stream has been determined. The DEIS should acknowledge all of these issues in any statement of beneficial impact associated with proposed instream structures.

34-33

7. Pages 16-17, Wetland and Riparian Habitat

As previously indicated, the adequacy of proposed mitigation cannot be determined until the habitat values and wetland area which would be impacted by the preferred alternative have been determined. Also as previously indicated, the value of the riparian vegetation associated with Apapilco Creek, a "6" on a scale of 1 to 10, is incorrect if we take into consideration the fact that three year old willows are accorded a value of "7" at proposed mitigation sites. We conclude that the statements of relative habitat value for areas negatively impacted by the preferred alternative and areas proposed as mitigation are categorically in error, and that this results in an understatement of impact and an overstatement of mitigation values.

34-34

Several of the species and species guilds which were used to determine both impact and mitigation efficiency are inappropriate. "Waterfowl-shore birds" and "wading birds", for example, do not make appreciable use of wetlands which would be negatively impacted by the preferred alternative. Additionally, we recommend in-kind replacement of habitat which would be lost. Inasmuch as virtually all wetlands impacted are riparian in nature, the Department recommends the creation of riparian habitat as compensation. Further, the Department recommends against the use of the sediment basins below the proposed fill as mitigation for lost riparian

34-35

habitat. This area, based in part upon the example provided by the existing Corinda Los Trancos landfill, would be subjected to continual and chronic disturbance both in terms of sedimentation and in terms of requisite maintenance. Therefore, we recommend that the sediment basins be deleted as areas in which to compensate for lost riparian habitat. However, we acknowledge that such sediment basins are necessary to control sedimentation of areas downstream.

34-36

34-37

34-37

8. Page 17-20, Upland Habitat

The DEIS fails to quantitatively or qualitatively define the magnitude of impact to each component of the 277 acres of upland to be lost. The projected effects of the proposed mitigation program are unsupported, and maps D-2 and D-3 seem to indicate that Douglas - fir plantings are to be burned every 10 to 15 years along with chaparral. The discussion which attempts to show the mitigative value of the "grassland" to be produced on the finished faces of the landfill should be removed from the DEIS. We see little mitigatory value associated with proposed mitigation for the loss of 277 acres of upland habitat, and we recommend that the DEIS acknowledge the inadequacy of proposed upland mitigation.

34-38

34-39

9. Pages 20-21, Corinda Los Trancos Watershed Wetland and Riparian Revegetation

As previously indicated we believe that the statements of existing habitat value and post-restoration habitat values are arbitrary, unsupported, and should be eliminated from the DEIS.

34-40

10. Page 22, Corinda Los Trancos Ponds

See comment 7.

34-41

11. Pages 23-24, Arroyo Leon and San Pedro Creek Watershed Barrier Modifications

In order to determine the potential effect of these proposed barrier modifications it would be necessary to determine the importance of "low flows" to steelhead migration requirements in each of the two streams. It is likely that high flows are far more important to steelhead migration in these streams, and that correcting low-flow barriers may result in little benefit to steelhead. Therefore, we recommend the completion of additional studies which document the advantage to steelhead which would be gained by proposed low-flow barrier modification, or we recommend that this DEIS indicate that this mitigation measure may be without value.

34-42

12. Page 24

The statement is made that the preferred alternative would result in "changing the sediment characteristics by reducing the yield of sands and silts by 339 tons per year significantly enhancing the aquatic habitat" of Apanolio Creek. The DEIS should explain precisely why this "significant enhancement" has not occurred below the Corinda Los Trancos landfill site.

34-43

13. The projected 40 percent decrease in summer flows in Apanolio Creek which would result from implementation of the preferred alternative is unacceptable, and would undoubtedly result in significant adverse impacts to fishery resources. If the preferred alternative is ultimately selected, we recommend that water be purchased by the project proponent and liberated into Apanolio Creek below the landfill so that no reduction in summer flows occurs.

34-44

Summary and Conclusions

The Department strongly recommends against Corps certification of the subject DEIS. We find the DEIS to be inadequate in its analysis of alternatives to the preferred alternative, in its assessment of fish and wildlife impacts, and in its assessment of mitigation adequacy.

34-45

As a solution to San Mateo County's pressing solid waste problems, we recommend the selection of the Corinda Los Trancos alternative. This would provide the County with time to determine the least environmentally damaging feasible alternative solution to its solid waste disposal problem, and would not result in what would be the apparently needless loss of the more significant biological resources associated with Apanolio Canyon. The Corinda Los Trancos alternative would require preparation of an EIR and most likely, and EIS. These documents should be prepared in such a manner as to avoid the deficiencies we have noted regarding the subject DEIS.

34-46

State of California

Memorandum

August 15, 1988

To : The Honorable Gordon K. Van Vleet
Secretary for Resources
1416 Ninth Street
Sacramento, CA 95814

Attention: Gordon F. Snow, Ph.D.
Projects Coordinator

From : Department of Fish and Game

Subject :

Draft Environmental Impact Statement (DEIS) for the U.S. Army Corps of Engineers Public Notice No. 16611S91, Browning-Ferris Industries Landfill Near Half Moon Bay, San Mateo County, SCH 88061001

The Department of Fish and Game has reviewed the May 1988 DEIS for the Ox Mountain Sanitary Landfill Apanolio Canyon expansion site and we have the following comments:

The Department has been involved in the review of the project since December 9, 1983 when we commented on the Notice of Preparation of an EIR. Subsequently, we provided comments on the Notice of Preparation for a Supplemental EIR on November 18, 1986; the Supplemental DEIR on December 17, 1986; a letter from Ralph Osterling, Consultant to Browning-Ferris Industries on February 4, 1987; Corps Pre-Discharge Notification on February 26, 1987; and the Corps Public Notice No. 16611S91 on July 7, 1987, which subsequently was forwarded to the Corps by the Resources Agency on July 9, 1987.

In addition, comments on drafts of the "Wildlife and Fisheries Mitigation Plan for Ox Mountain Sanitary Landfill Apanolio Canyon Expansion", were provided to the consultant by the Department's Region 3 staff on January 22, and May 5, 1988. The DEIS has provided us with additional information, including an array of alternatives and as a result, we have additional comments and recommendations which should be addressed and resolved in any revised DEIS or FEIS.

The proposed Apanolio Canyon fill would provide the County of San Mateo with a major sanitary landfill with a conservatively estimated life expectancy of 93 years. The preferred alternative discussed by this DEIS would result in the loss of 4,272 linear feet of Apanolio Creek including 3,661 feet of stream which is known to contain a rainbow trout population which is most likely composed of both steelhead and resident subpopulations. The resident rainbow trout/steelhead juvenile population density was estimated at 1,502 juvenile/mile in September of 1986. Assuming that the 1986 sampling effort is representative of juvenile salmonid densities, we would expect the project to result

Asst. Secretary, Bureau of Land Management
California State Lands Commission
California State Lands Management
Bureau
Colorado River Board
Energy Resources Conservation
And Development Commission
San Francisco Bay Conservation
And Development Commission
State Coastal Conservancy
State Lands Division
State Reclamation Board
State Water Resources Control
Board
Regional Water Quality
Control Boards

GEORGE DEUKMEJIAN
GOVERNOR OF
CALIFORNIA



THE RESOURCES AGENCY OF CALIFORNIA
SACRAMENTO, CALIFORNIA

Colonel Galen Yanagihara
Army Corps of Engineers
ATTN: Barney Olson
211 Main Street
San Francisco, CA 94105

Dear Colonel Yanagihara:

The State transmitted its comments to you regarding the Draft EIS, Ox Mountain Sanitary Landfill, Apanolio Canyon Expansion Site, San Mateo County, by letter of July 26, 1988. That letter included comments of the Department of Fish and Game (DFG) as an attachment.

DFG has revised its comments on this matter. We have attached DFG's revised comments for your consideration.

We appreciate your cooperation in this matter and hope that this revision will not prove to be a problem in the Corps' analysis of this proposed project.

Sincerely,

Gordon F. Snow, Ph.D.
Gordon F. Snow, Ph.D.
Assistant Secretary for Resources

Attachment

cc: Department of Fish and Game
San Francisco Bay Regional Water Quality Control Board

Office of Planning and Research
1400 Tenth Street
Sacramento, CA 95814
(SCH 88061001)

in the permanent loss of approximately 1,040 juvenile salmonids per year. Additionally, the preferred alternative would (according to Table 1.3-1) result in DEIS-estimated loss of 8-11 acres of riparian wetlands, including 3.43 acres of Corps designated wetlands, and 277 acres of upland consisting of a mixture of chaparral, scrub, and Douglas fir dominated forest.

The Department finds the subject DEIS to be inadequate in terms of its alternatives analysis, its assessment of biological impact, and its assessment of the adequacy of proposed mitigation. The Department recommends against certification of this DEIS until and unless the Corps completes its alternatives analysis and determines that the preferred alternative is superior for reasons other than environmental reasons.

Based upon information contained in the DEIS, it appears that the Corinda Los Trancos Canyon (forefill) alternative is less environmentally damaging than the preferred alternative. The Corinda Los Trancos Canyon alternative would allow the Corps, County, and other concerned agencies at least sixteen years in which to attempt to avoid those more significant adverse impacts associated with this preferred alternative. Further, it appears that the rationale for selection of the preferred alternative over the Corinda Los Trancos Canyon alternative involves economic considerations. Should the Corps determine that the Corinda Los Trancos alternative is economically feasible, then the Department concludes that selection of the Corinda Los Trancos alternative over the preferred alternative would be consistent with both State and Federal law. Therefore, in the event that the Corps ultimately selects the preferred alternative, the FEIS should clearly specify the precise selection methodology employed by the Corps to support its conclusion that the preferred alternative is an environmentally acceptable alternative.

The methodology which was utilized to identify values associated with existing biological resources in the preferred alternative area is inadequate. Similarly, this methodology has resulted in what we perceive as an overstatement of the biological value which would be produced through proposed mitigation. For these reasons, regardless of which alternative site may be selected by the Corps, and prior to the certification of this DEIS, we recommend that the Corps convene a technical advisory team composed of biologists from the U.S. Fish and Wildlife Service, the Department, the Environmental Protection Agency, and the National Marine Fisheries Service. This team should be charged with unanimously determining biological impacts which would result from the alternative selected by the Corps, and the team should be charged with unanimously determining appropriate compensation for biological impacts generated by the Corps-selected alternative.

The Department considers the identification of appropriate water quality standards to be the responsibility of the Regional Water Quality Control Board (RWQCB), and for this reason, we choose not to provide detailed comments regarding water quality issues related to alternatives discussed in the DEIS. Rather, we will review and comment upon RWQCB findings regarding water quality issues, and will insist upon safeguards sufficient to result in no negative impacts to fish and other aquatic resources for as long as the sanitary landfill remains in place.

Lastly, should the Corps decide to permit either the Apanolio Canyon (1,200-foot) or any other alternative which results in the loss of sections of fish-bearing streams, such a choice must not be viewed as precedent for similar future projects.

Should you have questions regarding this letter, please contact me at (916) 445-3531.

Pete Bontadelli
Pete Bontadelli
Director

Responses - Comment Letter 1

1-1. The original archaeological report for the site was prepared by Mr. Peter Banks. This study was incorporated as the cultural resources chapter of the Draft Environmental Impact Report prepared by Thomas Reid Associates in 1983. No buildings occur at the Apanolio Canyon site nor have on-site investigations identified any archaeological resources.

Responses - Comment Letter 2

2-1. The calculation of potential particulate emissions from the construction and operation of the proposed project were based on assumptions regarding soil characteristics and fugitive dust generation rates. This calculation does not reflect expected reductions in fugitive dust emissions through implementation of recommended mitigation measures. Watering of exposed soils and unpaved roads is currently being conducted at the Corinda Los Trancos Canyon landfill. Any materials suspended tend to settle on or near the project site. Thus, with proper implementation of suggested mitigations, fugitive dust emissions should be drastically reduced and emissions that did occur would not likely be carried off site in any significant concentration. Compliance with applicable BAAQMD regulations should not be a problem and would be ensured through the Authority to Construct/Permit to Operate process.

2-2. Comment noted. Haul roads to the landfill would be paved.

2-3. Comment noted. Daily cover would be applied in accordance with BAAQMD permit and San Mateo County Office of Environmental Health requirements.

2-4. Based upon recent solid waste management experience, volatile organic compounds (VOCs) are emitted in low concentrations from most sanitary waste disposal sites. The types and quantities of these emissions can vary significantly from site to site. Variability is dependent upon several site-specific factors such as composition of the waste stream, the permeability of the landfill cover, and local climatological conditions (EMCON, pers. com., November, 1988).

The waste stream composition and climatic conditions for the Apanolio Canyon site would be very similar to those at the existing Corinda Los Trancos Canyon landfill. Because of these similarities, it would be appropriate to use the available data from the Corinda Los Trancos Canyon site for estimation of VOC emissions and other air quality impacts from the proposed Apanolio Canyon project.

Currently there is a broad based industrial move away from the use of toxic VOC compounds in household, commercial and industrial products. As a result, it is reasonable to assume that fewer VOC containing wastes will be disposed in sanitary landfills in the future. The planned implementation of a load checking program at Apanolio Canyon to screen incoming waste loads would also reduce the potential for accepting inappropriate wastes which contain high VOC concentrations.

Ambient air at the perimeter of the Corinda Los Trancos Canyon landfill was tested for the presence of 10 VOC compounds during three 24-hour test periods in March 1988. These tests were conducted as part of the air Solid Waste Assessment Test (SWAT) mandated by Section 41805.05 of the California Health and Safety Code. These tests were conducted in accordance with procedures established by the California Air Resources Board and the test program was approved by the BAAQMD. The landfill gas collection system was in place and operational at the time testing was performed. The conclusion of the air SWAT report was that no significant difference existed between upwind and downwind VOC concentrations (i.e., the landfill contribution is minimal). The test results contained in the air SWAT report are presented in Table 1.

Table 2 contains a summary of the VOC concentrations detected in the ambient air along with worker exposure limits (TLVs) recommended by the American Conference of Governmental Industrial Hygienists (ACGIH) and long term chronic exposure limits suggested by the California Department of Health Services (DHS). Health effects to workers and patrons can be assessed by comparing the ambient air concentrations to the TLVs. Impacts to nearby residents can be assessed by comparing the ambient concentrations detected adjacent to the fill to the DHS chronic exposure limits. It should be noted that this is a conservative estimate of probable impacts because no residents would actually be present in such close proximity to the fill. As can be seen, exposure to the VOC concentrations measured at the site should not pose a major health risk to site operators, patrons, nearby residents, or residents in Half Moon Bay.

2-5. Comment noted. In addition to obtaining a Permit to Operate for the landfill operations, BFI would also obtain a Permit to Operate the gas control system in accordance with BAAQMD Rule 34. Rule 34 requires that a landfill gas control system be installed when 1 million tons of refuse are in place.

Table 1. BFI Los Trancos Canyon Landfill
Ambient Air Volatile Organic Compound Test Results¹

Sample Number/ Type and Location ⁴	Sample Date	Volatile Organic Compound ² Concentrations (ppb) ³									
		VC	BENZ	ED8	DCA	MECL	PCE	CCl ₄	TCA	TCE	CHCl ₃
AA-7/24 HR UP	03/16/88	ND	0.63	ND	ND	120	0.22	0.12	1.1	0.88	ND
AA-8/WD UP	03/16/88	ND	0.69	ND	ND	42	0.22	0.13	0.57	ND	ND
AA-9/24 HR DWN	03/16/88	ND	0.14	ND	ND	8.8	ND	ND	0.15	0.23	ND
AA-10/WD DWN	03/16/88	ND	0.40	ND	ND	5.6	0.12	ND	0.45	ND	ND
AA-11/24 HR DWN C	03/16/88	ND	0.18	ND	ND	3.6	ND	ND	0.25	ND	ND
AA-13/24 HR UP	03/17/88	ND	0.4	ND	ND	ND	0.2	0.1	ND	0.3	ND
AA-14/WD UP	03/17/88	ND	1.0	ND	ND	ND	0.1	0.1	ND	0.1	ND
AA-15/24 HR DWN	03/17/88	ND	0.4	ND	ND	ND	0.1	ND	0.2	0.4	ND
AA-16/WD DWN	03/17/88	ND	0.5	ND	ND	6.1	0.2	ND	0.3	ND	ND
AA-17/24 HR DWN C	03/17/88	ND	0.3	ND	ND	4.6	0.1	ND	ND	ND	ND
AA-19/24 HR UP	03/23/88	ND	0.3	ND	ND	ND	ND	ND	0.1	0.3	ND
AA-20/WD UP	03/23/88	ND	0.4	ND	ND	ND	ND	ND	ND	ND	ND
AA-21/24 HR DWN C	03/23/88	ND	0.9	ND	ND	ND	ND	ND	ND	0.1	ND
AA-22/24 HR DWN	03/23/88	ND	0.5	ND	ND	ND	ND	0.1	ND	0.4	ND
AA-23/WD DWN	03/23/88	ND	0.7	ND	ND	5.6	ND	ND	0.1	ND	ND
Regulatory Detection Limit		2	2	0.5	0.2	1	0.2	0.2	0.5	0.6	0.8
Laboratory Detection Limit		0.2	0.09	0.06	0.1	1.0	0.04	0.07	0.08	0.09	0.09

1. Air Quality Solid Waste Assessment Test Report, Los Trancos Canyon Landfill (Ox Mountain), San Mateo, California, EMCN, September 1988.

2. VC = vinyl chloride
 BENZ = benzene
 ED8 = ethylene dibromide
 DCA = 1,2-dichloroethane
 MECL = methylene chloride
 ND = not detected
 PCE = tetrachloroethylene
 CCl₄ = carbon tetrachloride
 TCA = 1,1,1-trichloroethane
 TCE = trichloroethylene
 CHCl₃ = chloroform

3. ppb = parts per billion

4. 24 HR = 24-hour continuous sample
 WD = wind directionally controlled sample
 UP = upwind
 DWN = downwind
 C = co-located samples

Table 2. Health Risk Criteria for VOC Air Emissions
From Proposed BFI Apanolio Canyon Landfill

Compound	Highest Concentration Detected ¹ (ppb)	Worker Exposure Criteria ² (ppb)	Long-Term Exposure Criteria ³ (ppb)
Vinyl Chloride	ND	1,000 ⁴	--
Benzene	1.0	1,000	1.0
Ethylene Dibromide	ND	NA ⁵	--
1,2-Dichloroethane	ND	10,000	--
Methylene Chloride	120	50,000	--
Tetrachloroethylene	0.22	50,000	--
Carbon Tetrachloride	0.13	5,000	--
1,1,1-Trichloroethane	1.1	350,000	57
Trichloroethylene	0.88	50,000	1.3
Chloroform	ND	10,000	0.1

1. Highest ambient air concentration detected during the Los Trancos Canyon Air SWAT (EMCON, September 1988).
2. Threshold Limit Values - Time Weighted Averages (TLV-TWA) as established by the American Conference of Governmental Industrial Hygienists (ACGIH). A TLV-TWA is the time weighted average concentration of an airborne substance for a normal 8-hour work day and a 40-hour work week to which nearly all workers may be repeatedly exposed, day after day, without adverse effect.
3. Applied Action Levels for air as established by the California Department of Health Services, Toxic Substances Control Division.
4. Permissible Exposure Limit (PEL) published by the Occupational Safety and Health Administration (OSHA). The PEL for benzene is listed because it is lower than the 10,000 ppb standard recommended by the ACGIH.
5. No worker exposure criteria is published by the ACGIH. The ACGIH considers ethylene dibromide a suspected human carcinogen.

Responses - Comment Letter 3

3-1. The ABAG letter, dated July 7, 1987, was in response to the Corps Public Notice No. 16611S91 released on June 8, 1987. This response letter has been added to Appendix A.

3-2. The three requirements and conditions will be incorporated as follows:

a) Protection of water quality would be accomplished through landfill design and conformance with CAC Title 23, Chapter 3, Subchapter 15. Components that will ensure water resource protection are presented in Chapter 3 of the EIS. A monitoring program, approved by the RWQCB would be implemented to provide early detection of a failure of the landfill containment system. In the unlikely event failure occurred, a contingency plan (or corrective action program) approved by the RWQCB, would be implemented. This plan is presented in Appendix D.

b) Mitigation of biological impacts resulting from landfill construction would be provided through the Mitigation Plan developed by Ralph Osterling Consultants (Appendix B).

c) Waste reduction programs are being planned and implemented by numerous jurisdictions within San Mateo County. BFI is active in pursuing waste reduction programs, as are other franchise companies. The current efforts for establishment of effective waste recycling programs are presented in Chapter 3.5e of the EIS.

Responses - Comment Letter 4

4- Comments noted.

AD-A207 706

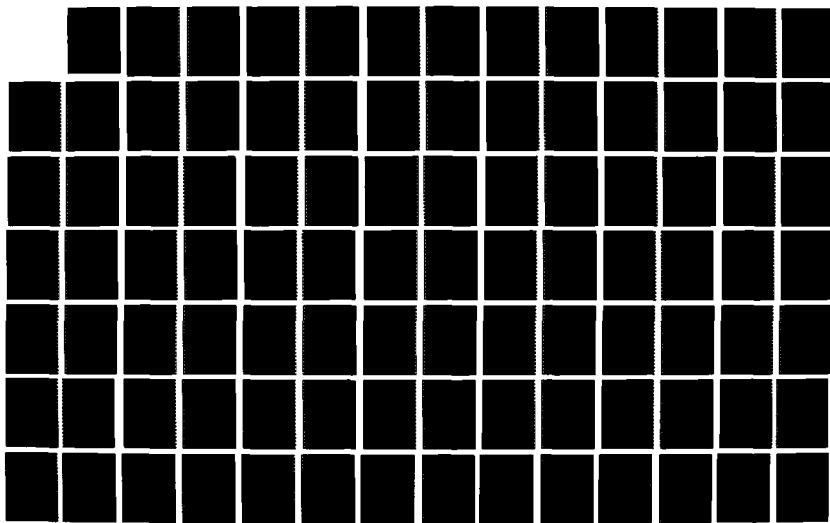
OX MOUNTAIN SANITARY LANDFILL APANOLITO CANYON EXPANSION
SITE SAN MATEO CO (U) HARDING-LAWSON ASSOCIATES NOVATO
CA APR 89

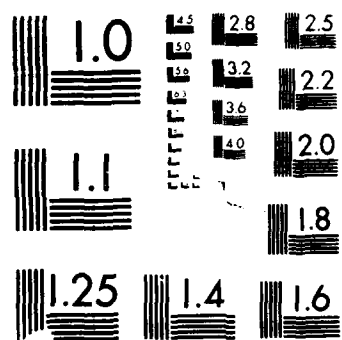
67

UNCLASSIFIED

F/G 24/3

NL





Responses - Comment Letter 5

5-1. The Corps has independently reviewed and considered relevant data concerning the proposed project site and its alternatives.

5-2. The preferred alternative (i.e., Apanolio Canyon 1,200-foot) presented in the Draft EIS is the applicant's preferred alternative as stated on page 3-20. The EIS identifies impacts associated with the 1,200-foot Apanolio Canyon Alternative and does not attempt to justify or suggest approval of this alternative. The presentation of the most viable alternative sites (Corinda Los Trancos and Nuff Canyons) in parallel to the Apanolio Canyon project is an attempt to provide decision makers with useful comparisons to the proposed action. The DEIS identifies and presents the impacts of the Apanolio Canyon project (3.43 acres of wetland and 5,600 feet of stream) as well as impacts to these resources at other alternative sites.

40 CFR Section 1502.14(e) does not require the lead agency identify its preferred alternative in the Draft EIS. This section states that an agency must identify its preferred alternative, if one exists.

5-3. Response to the statement of inadequacies in the areas listed are provided in detail in the following specific comments.

5-4. The EIS identifies and evaluates the types of impacts and resources that would be affected by the proposed action and its alternatives. The purpose of the EIS is to identify and evaluate potential impacts (identified through the environmental evaluation and scoping process), as well as to draw comment from the public and agencies regarding the adequacy or accuracy of the information presented. Per 40 CFR 1502.9(b) the Final EIS (FEIS) shall respond to comments on the draft statement and shall further discuss issues not adequately discussed in the draft. The level of detail required to provide all decision makers with adequate information to comment on the Corps action, based on the comments received on the draft statement, will be generated and incorporated into the FEIS.

5-5. In attempting to identify mitigation areas for the habitat that would be lost in Apanolio Canyon, areas within Apanolio Canyon were investigated for potential mitigation projects. Appropriate mitigation potential did not exist within the Apanolio Creek watershed. Consultation with CDFG lead to a broadening of the potential mitigation area to include the Pilarcitos Creek watershed. Maximum use of mitigation potential was made within Apanolio Canyon and the adjacent Corinda Los Trancos Canyon. To provide further mitigation, the mitigation area was expanded beyond these two canyons until adequate quantity and value of mitigation could be obtained.

5-6. The information presented regarding the San Francisco garter snake is summarized from a report prepared by Dr. Sam McGinnis. This report is contained in Appendix B.

Preliminary studies by San Francisco garter snake experts indicated that appropriate habitat for the snake does not occur in the project area, however, potential habitat did exist in the lower canyon and the adjacent Corinda Los Trancos Canyon. To verify the findings of this preliminary evaluation trapping studies were conducted in Apanolio and Corinda Los Trancos Canyons.

The trapping studies, performed by McGinnis between May, 1987 and May, 1988 (one full year), provided over 13,500 trap days of information. No San Francisco garter snakes were trapped, and the study concluded that at present no San Francisco garter snakes exist in the project area. Other San Francisco garter snake studies identified the presence of the snake in the marsh area near the mouth of Pilarcitos Creek and potential populations at Mud Lake in the upper end of Pilarcitos drainage. Both locations are beyond any confirmed migration distance for the snake. The U.S. Fish and Wildlife Service has been informed of the study methodology and results and previously commented on the study area (letter dated September 16, 1987, see Section 4.3.4.c), stating that in their opinion the snake does not exist in the project area.

5-7. No impact to Apanolio Creek summer low flows would occur. Augmentation flows would be provided for by pumping water from ponds to be constructed in lower Corinda Los Trancos Canyon to Apanolio Creek. Water storage would be provided by these ponds which would be filled by winter storm-water runoff in Corinda Los Trancos Creek. Only during the driest of years would storm-water flows be too low to fill these ponds. In addition, wells and hydraugers would be developed in the upper reaches of Apanolio Canyon and Corinda Los Trancos Canyon for use as a backup water source. Existing data indicates that flows of 4 to 8 gallons per minute could be maintained by each well or hydrauger in these areas in perpetuity. Quality of augmentation water would be controlled through quarterly sampling and use of well/hydrauger water if necessary. For additional detail regarding proposed pond design and stream flow augmentation plans see the Mitigation Plan, Appendix B and the Purcell, Rhoades & Associates letter report in Appendix D.

5-8. Traffic impacts anticipated for the proposed action and alternatives are discussed in Section 5.4 of the EIS. Air quality impacts projected for construction and operation of the project are discussed in Section 5.5.

5-9. Selection of alternative sites was based upon an attempt to identify viable alternatives with a potential to have a lesser impact than the proposed action. This process provided an evaluation of all sites

identified in San Mateo County with potential for development. The potential sites were screened for "fatal flaws" that would significantly impede or prevent their development (e.g., location of geologic faults, access routes, and surrounding land uses). In fact due to the proximity and physiographic nature of the alternative sites, impacts associated with each of the alternative sites are similar.

5-10. The Corps' responsibility regarding alternatives is dictated by the 404(b)(1) guidelines. The EIS presents the alternatives identified as being both viable and potentially avoiding or reducing the environmental impacts associated with the proposed action. No attempt was made to justify any previous actions on the part of BFI or the County. The comparison of the alternatives is limited to presentation of factual information to the best of the Corps understanding of the alternative sites.

See response to comment 5-2 regarding preferred alternative.

5-11. An expanded discussion of the potential landfill sites identified within San Mateo County is presented in Section 3.3 of the EIS. The intent of the alternatives screening analysis presented in the EIS is to identify feasible alternatives to the proposed project while potentially reducing the magnitude of environmental impacts associated with project development. The site screening employed was intended to identify "fatal flaw" characteristics that may preclude or complicate development of the potential alternative sites. The results of this evaluation indicate that Corinda Los Trancos Canyon and Nuff Canyon appear to provide feasible landfill locations while potentially reducing the magnitude of environmental impacts associated with development of a disposal site in Apanolio Canyon. Other sites, while potentially reducing certain impacts, were restrained by other factors such as access.

5-12. The estimate of wetland resources in Nuff Canyon has been updated using field data collected since the publication of the DEIS. The results of this evaluation are presented in Sections 4.3d and 5.3d of the EIS. Other information presented for Nuff Canyon represents the greatest level of detail that could be generated from existing information and restricted site accessibility. Information provided should allow meaningful comparison with other alternatives considered.

5-13. The discussion of out-of-county disposal has been expanded to explain the complex permitting process required (see Section 3.3). The complications identified in the EIS (i.e., increased cost and permitting requirements) represent real problems associated with export of San Mateo County solid wastes. Identification of potential impacts and development of mitigations for out-of-county disposal would be determined upon application to the controlling jurisdiction for the proposed disposal site. At that time, impacts to the environment could be determined and would be evaluated under CEQA.

5-14. The discussion of recycling efforts in San Mateo County has been expanded (see Section 3.5e). This information illustrates the ongoing efforts by the County, cities, and franchise companies to increase the diversion of materials from County landfills. Even with recycling efforts, disposal of the large quantities of solid wastes generated within the County requires a large capacity site. Revisions to the County's 1988 Solid Waste Management Plan indicate that even if the recycling goals currently established, (i.e., 35 percent diversion) were achieved, approximately 700,000 tons of municipal solid wastes would require disposal each year.

5-15.

- The cost comparison data used represents current disposal fees at the Corinda Los Trancos landfill as well as current fees being paid by other jurisdictions exporting solid wastes (e.g., fees paid by San Francisco for disposal at Altamont). Landfill disposal costs for out-of-county disposal would be negotiated with the importing jurisdiction. As landfill capacity diminishes in the state and in the Bay Area, these costs are very likely to increase. Thus, the numbers used for the out-of-county disposal are based on existing fees, and may not reflect future disposal fees. Similarly, disposal fees could change from those currently used for the Corinda Los Trancos facility. Therefore, because it may not be possible to accurately predicted future disposal rates, using the existing rates is applicable and appropriate.
- The information source for the mineral resource extraction operation in Nuff Canyon was obtained from the quarry planner. This information source has access to quarry records and has provided projections for future quarry activities. The method of calculating the value of the mineral resource is intended to provide a realistic estimate of resource value through the life of the operation. The potential development scenarios for development of a landfill in Nuff Canyon are briefly discussed in Section 3.3 of the EIS.
- As indicated in the EIS, the reason for increased cost per acre for development of Nuff Canyon relative to Apanolio Canyon is primarily a result of the need to excavate an estimated 8.6 million cubic yards of material and construct a toe berm and leachate/ground-water pumping station. The same reasons apply to construction of the Corinda Los Trancos Canyon Alternative. The geology of these canyons differs from that of the northern portion of Apanolio Canyon. Apanolio Canyon, in the vicinity of the proposed project area, is underlain by a much thinner sequence of sedimentary and weathered bedrock material. Because of this, the depth of excavation is reduced and a gravity feed ground-water and leachate collection systems can be employed.

- Contingency costs required for remedial actions during landfill operation are not included in the cost estimate. These costs would be highly incident specific and would likely be in many cases similar for all alternatives being evaluated.
- A review of the sales and listings of properties near BFI's Ox Mountain Sanitary Landfill indicates a steady increase in value, similar to that being experienced in the general coastal area. Although there have been few sales in the immediate area, those that have been offered for sale have sold substantially above the previous price (Patricia F. Bennie, Caldwell Banker/Oceanshore Brokerage, letter dated October 31, 1988).
- The cost comparison is intended to provide both a total cost and a per unit disposal cost. The unit disposal cost (cost per cubic yard of solid waste) and cost per year of operating allows a comparison that considers both total project cost and project capacity or life-span. Life-spans of the alternatives were determined using preliminary engineering assumptions to generate total volume of each alternative site. The number of years of capacity were then determined using the current solid waste production rate and an assumed volume increase per year. Quantities and assumptions were uniform for determining alternative site life-spans.

Additional discussion of potential landfill development options in Nuff Canyon is presented in Section 3.3. A phased project in Nuff Canyon could be a combination of scenarios 1 and 3 as presented in Section 3.3 of the EIS. The anticipated time to fill the northern portion of the Canyon is 27 years. With this development option the quarry could continue to operate for an estimated 50 years. However, if the mid and southern portions of the Canyon were then developed (i.e., the landfill expanded south into the quarry area), as proposed in development option 1 (filling the entire canyon), then quarry operations would be terminated. Under this scenario, the quarry would cease operation an estimated 23 years earlier.

5-16. There would be no reduction in summer stream flows in Apanolio Creek. Any reduction in flow caused by landfill development would be offset by augmentation with water supplied from ponds in Corinda Los Trancos Canyon and, as a backup, wells in upper Apanolio and Corinda Los Trancos Canyons. Water quality would be monitored quarterly per Waste Discharge Orders, and if contamination occurred, the Contingency Remedial Action Plan for the project would provide measures for replacement of domestic water supplies. See response 5-7 and the Contingency Remedial Action Plan contained in Appendix D.

5-17. The EIS assumes that short-term impacts are those impacts occurring or lasting over a relatively short period of time, that being from days to several months. An example of short-term impacts would be impacts associated with initial construction of the landfill and its associated roadways and structures. Long-term impacts are considered to be impacts that would occur through the life of each project and beyond. For example, impacts associated with operation of the proposed Apanolio Canyon landfill, extending over the projected 93 year life of the project would be considered long-term impacts.

With these assumptions, the long-term impacts identified by the EIS (Section 5.14) include geologic impacts associated with permanent modification of the canyon topography and the permanent loss of wildlife and fishery habitat in its natural state. Because the County has designated the project site as its long-term disposal facility and given the remote nature of the site, no conflicts with existing or planned land use are anticipated. Effects on agricultural and associated land uses south of the project area within Apanolio Canyon also are not anticipated. Proper operation of the facility should prevent nuisance levels of vectors and project contingency plans are intended to correct any future release of contaminants from the landfill. Therefore, no impacts to downstream water quality or quantity would be expected.

BFI has not received any notice from Mr. Gossett, nor from the Department of Health, that the Ox Mountain Sanitary Landfill is causing problems related to increased rodent populations. BFI is required to comply with operating procedures, including daily cover requirements, defined by the Department of Health.

5-18. The Mitigation Plan presented in the Draft EIS has been revised based upon comments received from agencies and the public. This revised plan is presented in Appendix B.

5-19. The habitat value comparison methodology presented in the mitigation plan was developed to provide objective evaluations of habitat and to translate those evaluations to numbers which can be used for comparison purposes for mitigation. Each of the habitat factors and habitats is evaluated individually, both for the impacted area within Apanolio Creek and for the proposed off-site improvements. By utilizing an identical evaluation procedure, each is equated and compared on an equal basis. The results are not arbitrary, but rather the product of a systematically applied and realistic methodology.

Many systematic procedures for collecting and analyzing wildlife habitat data utilizing various rating schemes have been applied to the evaluation of land use impacts on wildlife habitat (Schemnitz, 1980). Most employ a combination of biological judgment and rating criteria. The methodology

used in the Apanolio Canyon Mitigation Plan is an adaptation of a system used by the U.S. Fish and Wildlife Service (Habitat Evaluation Procedure) which has been applied by numerous biologists in California, including Miller, et al, 1979. In addition, the methodology has been approved by the California Department of Fish and Game by the Department's letter dated May 5 from Theodore Wooster to Ralph Osterling, which states:

"...I have also reviewed the subjective habitat value comparison methodology that has been used to insure that there will be no net loss of wetlands and/or riparian acreage or wildlife habitat value when the project and proposed mitigation measures are considered together.

I believe this system accurately reflects the biological condition on the areas involved as I have observed them over the last two years..."

5-20. The Mitigation Plan is currently being reviewed by the California Department of Fish and Game and U.S. Fish and Wildlife Service. Qualified biologists/ecologists at these agencies will provide an evaluation of the plan's components and their mitigation value. Review and evaluation by them will provide a cross-check of the plan's adequacy and practicability.

5-21. Under ideal circumstances one continual stream course would be created/enhanced as mitigation for the loss of riparian/wetland habitat in Apanolio Canyon. However, such a site does not exist. BFI and its consultants have considered a wide range of mitigation opportunities in developing the plan presented in Appendix B. In keeping with accepted resource agency mitigation priorities (i.e., in-kind, on-site mitigation is most desirable) the mitigation efforts first targeted areas within the Apanolio drainage; second, within the Pilarcitos Creek drainage; and third, in the general area along the San Mateo County Coast. These efforts resulted in the development of the components that form the Mitigation Plan.

The Mitigation Plan (dated January 1989) provides a 1.2:1 ratio of mitigated riparian/wetlands to filled riparian/wetlands and is intended to compensate for the varying habitat types.

5-22. Revisions to the Mitigation Plan include stream channel mitigations in Corinda Los Trancos Creek that are intended to compensate for the stream channel lost in Apanolio Creek. The mitigation within Corinda Los Trancos Canyon provides for: 1) eight wetland/riparian corridors to be constructed below the existing landfill, and 2) instream fishery improvements including streambank recontouring, pool creation, importation of spawning gravels, streambank revegetation, and sediment control.

Regarding the potential for Apanolio Creek to support steelhead trout, Mr. Thomas Payne confirmed the following based on sampling conducted jointly by U. S. Fish and Wildlife Service and the California Department of Fish and Game, and his field sampling:

"In summary, the available evidence is: 1) no adult steelhead have been seen in upper Apanolio Creek, 2) no steelhead smolts have been captured, 3) sexually mature adult rainbow trout are present, 4) the population structure is more indicative of resident trout than of steelhead, and 5) an impassable barrier appears to exist in the lower creek. Scientific method requires a conclusion that only resident rainbow trout presently occur in the proposed project area until some piece of evidence shows otherwise. Based on this analysis, our recommendation for the EIS is to refer to the existing fish populations in the project area as being composed of resident rainbow trout (Salmo gairdneri Richardson). Apanolio Creek above the dam can also be described as historic and potential steelhead habitat, since without the dam steelhead would very probably ascend to the upper reaches of the watershed."

A copy of Tom Payne's report is contained in Appendix B of this EIS.

5-23. The Mitigation Plan proposes several projects that, because of the method by which they are carried out, qualify as mitigation and not landfill maintenance.

The prescribed burn program included in the Mitigation Plan is suggested in the Public Health and Safety mitigation, and with proper implementation would benefit wildlife. Burning of areas upland from a landfill is not necessarily considered landfill maintenance. For example, burning is not part of the maintenance program at the Corinda Los Trancos Canyon landfill. A prescribed burn program would increase the productive capacity of the upland areas by reducing the quantity of decadent and low productive brush species and increasing the quantity of younger growth suitable for wildlife.

Grassland development on the landfill face could be limited to maintenance, but the Mitigation Plan calls for species of grasses and forbes that most benefit wildlife, such as lana vetch which has high seed production. A grassland face would provide a habitat "edge" and thus diversity in the cover types and food sources located in Apanolio Canyon. Presently no grassland areas exist within the upper canyon. This island of new habitat could provide food and foraging grounds for a variety of species such as raptors and deer. In addition, mitigation calls for development of stacked brush for quail and small animal habitat on the landfill face.

The 1,500 foot concrete channel that drains the side of the Corinda Los Trancos Canyon landfill is a maintenance structure. However, planting ceanothus brush along its channel is intended to lower the temperature of the water in it to benefit downstream wildlife and to create a wildlife brush corridor adjacent to the existing landfill.

Sediment control structures are part of the maintenance program of landfills. However, the mitigation plan calls for enhancement around these structures and access to them to be designed specifically to preserve riparian plantings.

5-24. BFI plans to implement the components of the Mitigation Plan immediately upon receipt of all necessary permits for the development of the Apanolio Project. It is anticipated that BFI consultants, working in cooperation with California Department of Fish and Game personnel, would implement the entire mitigation program. With the exception of a few components within the project area, most mitigation would be in place by the winter of 1989-1990. BFI would be responsible for the maintenance of the mitigated areas for 5 years.

5-25. Comment noted. See response to comment 5-24 concerning maintenance responsibility.

5-26. BFI was permitted to fill 33.5 acres of wetland at their Newby Island sanitary landfill. The mitigation required by the State Water Resources Control Board for this action was payment of \$110,000 into a trust fund to be used for acquisition and/or enhancement of wetland areas, plus preservation of 11.5 of the wetland acres within the existing site. As an alternative to preserving 11.5 acres within the site, BFI was allowed to fill this area for payment of an additional \$57,500 into the trust fund. Thus, a total of \$167,500 was paid into the trust fund to be administered by the California Regional Water Quality Control Board, San Francisco Bay Region, immediately following issuance of the final order by the State Water Resources Control Board on November 17, 1983. Payment of that sum discharged all obligations of BFI regarding mitigation for filling of the Newby Island site.

5-27. For additional information about the San Francisco garter snake, see response to comment 5-6.

5-28. In the opinion of the ornithologist completing the marbled murrelet study, the Point Reyes Bird Observatory report is conclusive, complete and accurate (letter from Harry R. Carter, Point Reyes Bird Observatory to Ralph Osterling, November 4, 1988). More comprehensive field studies are not needed based on the lack of appropriate murrelet habitat in Apanolio Canyon. Marbled murrelets require old-growth Douglas fir with large, flat branches located high in an open crown structure, but protected from predators and weather. The Douglas fir in Apanolio Canyon have large, sloping branches close to the ground that are unprotected from danger and are thus unsuitable for the murrelet. See the Marbled Murrelet Study in Appendix B for discussion of habitat.

5-29. Impacts to downstream beneficial uses would occur if downstream flows or water quality were modified. To mitigate the potential for significant impacts to downstream conditions, an augmentation plan has been developed (see response to comment 5-7). In addition, to ensure protection of downstream water quality, a Contingency Remedial Action Plan has been developed. In the event of a release of contaminants from the landfill,

measures would be enacted to prevent or replace downstream beneficial uses. Therefore, impacts to beneficial uses as defined in the EIS are expected to be reduced to a level of insignificance.

5-30. There would be no reduction in summer stream flows in Apanolio Creek. The stream flow augmentation plan provides for maintenance of stream flows, resulting in no change in summer low flows. See response 5-7 and 5-16.

5-31. Streamflow alteration anticipated to result from landfill construction would be mitigated through flow augmentation. A streamflow augmentation program, presented in Appendix D, would guarantee existing low flows in Apanolio Creek. To prevent loss of ground-water recharge to the lower canyon aquifer, a ground-water recharge plan has been developed (see Appendix D).

5-32. The geologic cross sections illustrated in Figure 4.1-4 were constructed using data obtained from geologic surface mapping, and monitoring well and geologic boring data generated during geotechnical investigation of the canyon. Figure 4.1-3 (Revised) of the EIS shows the location of borings made within Apanolio Canyon. Appendix D contains summary data on locations and elevations of borings. The cross sections presented in Figure 4.1-4 show geologic contact lines, dashed where approximate and question marked where uncertain which is a standard in the profession.

To provide additional geologic information, Appendix D contains three geologic cross sections of Apanolio Canyon. Weathered and unweathered bedrock contacts are shown as well as the recent alluvium/colluvium deposits. These cross sections are based upon drill hole data and boring logs within the canyon. Dashed lines are present where there is lack of definitive information between the borings. Contacts are dashed and question marked to indicate an interpolation of the contact lines between borings.

5-33. Ground-water level information is provided in Table 4.2-4 and Figure 4.2-2 of the EIS. To provide additional information on the ground-water conditions in Apanolio Canyon, potentiometric surface maps are provided in Appendix D. These maps illustrate that the direction of ground-water flow in the canyon is from the northern upper elevations toward the southern portion of the canyon (i.e., Pilarcitos Creek). The ground-water flow lines approximate the surface drainage. Ground-water is absent from the ridge crests, indicating a discontinuity of aquifers from one canyon to the next.

Examination of the information on ground-water occurrence and ground-water flow lines indicate that water moves through a relatively thin veneer of permeable materials and follows the topography. Potential

migration pathways, in the event that leachate entered the ground-water system, would be along this near surface layer of more permeable material. Studies indicate that at the toe of the landfill, ground-water flow rates in the alluvial material is 4.6 feet per day. The estimated velocity of water flow through the alluvial material in the southern portion of Apanolio Canyon is 0.56 feet per day. Using an average velocity of 2.58 feet per day for the canyon below the landfill, approximately 12.3 years would be required for an unremediated leachate plume to reach Pilarcitos Creek and 2.7 years to reach the nearest downgradient private well (PRA, 1988).

5-34. Although tests indicate there is isolation between the stream and the shallow aquifer, there is the potential that a hydraulic connection could exist along the stream course. Therefore, if contamination of either resource were to occur, degradation of the other could follow. However, data indicates that if contamination occurred, the rate of contamination of either resource from the other would be at a very slow rate. See response to comment 5-33.

5-35. A complete listing of the boring locations for all boreholes drilled is contained in Appendix D. A log was made for each of the boreholes and well "as-built" construction details included for those boreholes which were turned into monitoring wells. Figure 4.2-2 of the EIS shows surface- and ground-water sampling locations only. Due to the scale and map reduction for the EIS, not all the borings locations were shown on EIS Fig. 4.2-2. Boring locations are now shown on EIS Fig. 4.1-3. Potentiometric maps of the canyon are presented and discussed in the response to comment 5-33.

5-36. The operator (BFI) and its consultants have been working within the purview of the RWQCB to establish background water quality protection standards. Representative water quality data for the project area are presented in the EIS. A contingency remedial action plan (see Appendix D) developed for the proposed project outlines actions for the treatment or replacement of beneficial uses of the waters should contamination of surface or ground-water resources occur.

The sediment load in Apanolio Creek is quite high, primarily following major storm events, due to the nature of the upper canyon alluvium, colluvium and highly weathered bedrock. The proposed sedimentation basin would effectively reduce the sediment load in the Apanolio Creek, by removing the majority of sand and silt particles from flows entering the basin.

5-37. Further investigations of site conditions and evaluation of water quality data have been conducted to determine the source of contamination found in that particular downgradient monitoring well at the base of the toe berm. Evidence indicates that contamination is due to a surface spill while

handling leachate from the leachate storage tank. The absence of any leachate in the immediately upgradient leachate monitoring well is further evidence that leachate from the Corinda Los Trancos Landfill is not leaking through the existing toe berm. The adjacent private well referenced is a water well at the nearby Ranch House. The source of the contamination of the Ranch House well was definitively traced to the presence of old creosote treated wood upgradient and nearby the well. The RWQCB has agreed with this analysis and further concluded that leachate from the landfill is not affecting this domestic well supply.

5-38. Extensive sampling of ground water from existing wells in Corinda Los Trancos and Apanolio Canyons has been performed under the purview of the RWQCB to establish water quality protection standards. Water quality analysis for both Apanolio Canyon and the Corinda Los Trancos Canyon landfill included general mineral and drinking water standards, as well as analysis using EPA 624 and 625 methods. Volatile organics tests have been performed and baseline water quality conditions established. Leachate analysis, as would be expected, indicated the presence of volatile organic compounds.

The geology of neighboring canyons is very similar to the geology of Apanolio and Corinda Los Trancos Canyons. This fact, along with the close proximity of the surrounding basins, indicates that the ground-water quality in the neighboring alternative site canyons should be similar as well. In short, for the sake of comparison of the alternatives to the Apanolio Canyon expansion site, background ground-water quality should be assumed to be equitable.

5-39. The probability of failure of the leachate collection and removal system (LCRS) would be remote. The LCRS would be designed to withstand the maximum probable earthquake without failure. The clay liner would be plastic enough to flex without significant cracking. The effectiveness of the filter fabric gravel layer leachate collection system should not be significantly reduced by seismic events or differential settling of overlying waste materials. A contingency plan for failure of the engineered systems, including the LCRS, has been prepared and is presented in Appendix D.

Purcell, Rhoades & Associates has estimated potential leachate production volumes. The methodology, assumptions, and calculations are presented in a report contained in Appendix D. Estimates indicate that leachate generation from Area 2 would be 12.4 gallons per minute (2,384 cubic feet per day). The gravel blanket component of the leachate collection system alone would provide an estimated 56,102 cubic feet of storage. Thus, using this capacity and the anticipated leachate yield, approximately 23 days of storage would be provided (approximately 11 times the volume required by Section 2543(b) of Subchapter 15). The report presented in Appendix D also discusses leachate treatment options and remedial action plans in the event of system or containment failures.

Increased sediment flow would be anticipated during construction of the landfill. It should be noted however, that the first structure to be built would be the sedimentation basin. Thorough maintenance of the basin during early construction and prior to rainy seasons would eliminate excessive sediment loading into lower Apanolio Creek. It is estimated that the development of the landfill, by virtue of the sedimentation basin, would reduce the loading of sand and silts into lower Apanolio Creek.

5-40. The storm-water underdrain system would be installed in each tributary side-canyon watershed that drains directly into the main Apanolio Canyon Creek. The storm-water underdrains, as shown on figure 3.5-6 of the EIS, would be located in each identifiable watershed within the canyon. Detailed information on the underdrain system is described in Hydrocomp, January 1988.

There is no realistic way to accurately predict the bedrock ground-water yield and ground-water elevations that would occur in the drain during high and low flow conditions. Although a model could be created, there would be no way to verify it and predictions would be questionable. Source areas of ground-water flows and effect on flows from the site would be determined when the underdrain trench itself is cut, since fracture patterns could then be assessed. Assessment of fracture patterns by other methods would not be appropriate.

Potential reductions in downstream flows in Apanolio Creek would be mitigated through augmentation of flows from water obtained from ponds and wells. The issue of Apanolio Creek flows is also addressed in the response to Comment 5-7 and 5-16.

5-41. The landfill proponent (BFI) has applied for an exemption to the 5-foot separation requirement. A letter report to the RWQCB, prepared by Purcell, Rhoades & Associates (dated January 29, 1988), addresses the ground-water separation prescriptive standard of Section 2530(c) of Subchapter 15 and presents the evaluation required to demonstrate the adequacy of the proposed design. A copy of this letter report, entitled "Response to RWQCB letter of July 20, 1987 - Application for Exemptions, Apanolio Canyon Expansion Site, Ox Mountain, San Mateo County, California" is contained in Appendix D.

5-42. The maximum calculated rate of leachate production for Area 2 of the proposed project is 12.4 gallons per minute, or 2,384 cubic feet per day (see "Evaluation of Proposed Leachate Collection and Removal System (LCRS) and Leachate/Contaminated Ground-Water Treatment Systems, Area 2, Apanolio Canyon Expansion Site, San Mateo County, California." - Appendix D).

The expected volume production of leachate was calculated using the water balance method. Details of the equations and calculation method are presented in the Appendix to an October 1975 EPA report (EPA-SW-168). The

leachate collection and removal system would be designed so that there would be no leachate head buildup and therefore no leachate would be discharged to the surface and/or ground water.

Typical biological treatment processes for leachate might include:

1. Recycling leachate through the landfill.
2. Facultative lagoon.
3. Activated Sludge Package Treatment Systems.
4. Oxidation ditch.
5. Rotating biological contactor.

5-43. The fresh bedrock has been analyzed and determined to have more than adequate strength and bearing capacity to support the encased drain pipes and surcharge load of the waste fill material. Special studies have proposed to monitor underdrain performance for seismic activity and slow ground movement from settlement to further improve future phases of construction of the underdrain. Other details concerning the integrity design of the concrete under various mix combinations is discussed by Haynes and Associates report of May 20, 1988 which is presented in Appendix D.

It should also be noted that the 5-foot-thick subgrade barrier and 1-foot-thick clay liner separate the ground-water collection system from the overlying leachate collection and removal system. Even in the unlikely event of major cracking of the reinforced concrete encasing the underdrain, leachate would be effectively collected and would not be present to mix with storm runoff or collected ground water.

The subsurface facilities would be subject to visual T.V. inspection for the annual reports and repairs would be made as they are detected (see "Contingency Remedial Action Plan" - Appendix D).

5-44. There are several construction methods which would allow the liner to be installed on steep side slopes of the canyon. For example, the liner could be installed in vertical lifts with standard placing and compaction equipment and then reshaped to the final configuration with a Gradall type excavator. Experience in landfill projects has proven that fill can be placed on slopes up to 1:1 with over 90 percent relative compaction by pushing a vibrating roller up the slope with a long push bar.

5-45. The filter rock blanket ground-water collection system at the bottom of the landfill would be designed to ensure collection of ground water from areas that ground water would eventually flow toward. Geologists would map the entire area as excavation progresses and would identify all springs, seeps and major fracture systems with seepage potential and recommend the appropriate mitigation action. Ground-water seepage at the final excavation surface would be captured by horizontal drains (hydraugers) or tight-lines connected to the local concrete underdrain, or directed toward the front of the landfill.

5-46. The excavation of the colluvium, alluvium, and weathered bedrock would be performed under the supervision of a Certified Engineering Geologist or registered Civil Engineer. The geology of the canyon would be mapped as excavation progresses into fresh bedrock. Seeps and fractures would be noted, mapped and serviced by the ground-water collection system (GCS). There is very little ground water stored in the fresh bedrock and even less ground-water movement as tests have shown the fresh Montara Granodiorite to be essentially impermeable. No rise in the water table would be expected from areas of the fresh bedrock. Therefore, there would be no effect on leachate production and movement. It should again be noted that there would be a 5-foot-thick subgrade barrier and a 1-foot-thick clay liner separating the fresh bedrock from the leachate collection and removal system. Any seepage of ground water upward out of the bedrock would migrate along the contact line to the GCS rather than pipe upward into the relatively impermeable subgrade barrier, according to calculations performed using the Wong model (Wong, J., 1977, "The Designs of a System for Collecting Leachate from a Lined Landfill Site," Water Resources Research, Vol. 13, No. 2, April 1977).

5-47. The clay liner and subgrade barrier would completely encase the bottom and sides of the landfill. A high density polyethylene synthetic liner would be placed only where the leachate collection drain rock is located at the bottom of the landfill.

5-48. Details concerning the specifications and construction of the subgrade barrier are given in the PRA, January 31, 1988 clay liner report (Appendix D). A field and laboratory QA/QC program is currently being developed to set the standards for successful construction of this containment system.

5-49. No leachate would be expected to migrate through the clay liner. Leachate would be drained by the leachate collection and removal system before significant pressure could develop.

5-50. The effect of leachate on the clay liner is currently being studied under full bench tests by Haynes and Associates. Preliminary results indicate no adverse effects of the leachate on liner performance.

5-51. An acrylamide resin base grout with a solids content at least 8-1/2 percent would be used. The handling and placement of the grout would be performed under the supervision of a grouting engineer supervisor experienced in soil and rock application of the material. Leaching studies are currently under way to examine the potential impacts from the chemical grout. Other landfills in the Bay Area, including sites recently permitted site under Subchapter 15 regulation (e.g., Kirby Canyon) have approved chemical grout cut-off walls.

A report prepared by Purcell, Rhoades & Associates, titled "Geotechnical Recommendation for Proposed Grout Curtain, Apanolio Canyon Expansion Site, Ox Mountain, San Mateo County, California" (January 29, 1988) details the design and presents the specifications for the grout cut-off wall.

5-52. Experience at the Corinda Los Trancos landfill is that chemical grout curtains such as the one proposed for the Apanolio Canyon Expansion Site are extremely effective in reducing downgradient flows of ground water and/or leachate. Industry experience continues to show that grout curtains are an effectual means of reducing bulk rock permeability when properly controlled and installed. Relief wells, installed behind of the cut-off wall, would pump excessive head and prevent large quantities of water from coming into continual contact with the structure. Consequently there would be no leachate flow to downgradient fishery habitat.

5-53. The maximum probable earthquakes on the San Andreas Fault, located 3 miles from the site, is 8.3 on the Richter scale. Earthquake motions for such an event were developed by Seed and Idress (1970). The maximum probable design acceleration for such an event is 0.5 g. Purcell, Rhoades and Associates also calculated a worse case scenario for a situation involving a maximum bedrock design acceleration value of 0.6 g.

The report "Stability Analysis, Static and Dynamic Loading Conditions, Apanolio Canyon Expansion Site, Ox Mountain, San Mateo County, California" (Purcell, Rhoades & Associates, January 29, 1988) presents a detailed stability analysis for the refuse itself, and also an analysis of the seismic impact on the proposed leachate removal and collection system and clay liner design. This report also utilized the same stability analysis (Shake Program) approach as used in another Bay Area landfill, Kirby Canyon, San Jose, California.

5-54. The San Andreas, Hayward, and Calaveras faults were listed as the major active faults in the San Francisco Bay Area. The EIS also presents (Page 4-3) a discussion of the Seal Cove-San Gregorio and Palo Colorado faults.

5-55. Justification is based on USGS and CDMG published data used by others in the profession. Basis for this justification would include: 1) Activity level of the faults (Pilarcitos, San Mateo, and La Honda faults are not considered active, whereas the San Andreas, Hayward and Calaveras faults are classified active - last 10,000 years - and have also been active historically - last 200 years -); 2) length of fault; and 3) recurrence interval. Figure 4.1-1 has been revised to indicate the location of the San Mateo and La Honda faults.

5-56. Major and minor faults are general terms often of arbitrary meaning and variously used by different authors. Major is generally interpreted to mean large-scale or dominant. The AGI, 1980 2nd.ed.,

Glossary of Geology, defines major earthquake as, "An earthquake having a surface-wave magnitude of seven or greater on the Richter scale. Such a limit is arbitrary, and may vary according to the user." Using the above AGI definition as a guide, then a major fault might be defined as one capable of generating a Richter magnitude 7 (M-7) earthquake. Hence, by using this definition, the San Gregorio Fault Zone should be considered a 'major' fault. Weber and Cotton (1981) studied this fault in detail and concluded that it was capable of generating a maximum credible earthquake between M 7.7 and M 7.9 as summarized by Brabb and Olson (1986), in "Map Showing Faults and Earthquake Epicenters in San Mateo County, California".

Regarding the comment, "Minor faulting could be critical to the siting of a landfill, especially if the fault activity is recent", no evidence of recent fault activity on minor faults at the site was found during this study. Further, none has been reported by Brabb and Olson (1986) and Hart (1985) in "Fault-Rupture Hazard Zones in California".

5-57. A variety of techniques, including air photo interpretation, trenching, well borings, geophysical surveying and geologic mapping have been employed by Purcell, Rhoades & Associates to determine the presence of any faults within the site, particularly of faults with Holocene or Quaternary activity. In addition, paired angle borings were drilled across the canyon bottom beneath Apanolio Creek to determine if a major north-south trending fault was present, as might be evidenced by an extensive zone of weathering or of highly fractured and sheared rock. Results of the field investigations and research of geologic literature indicate that active faults do not lie within the boundary of the proposed site.

5-58, 59. Subchapter 15 requires that all structures be designed for the maximum probable earthquake (MPE) forces. Pertinent referenced materials and other studies concerning the proposed Apanolio Canyon Landfill have been reviewed in order to provide the following seismic acceleration values for design consideration. Findings are as follows:

The pertinent seismic acceleration value is based upon the maximum probable earthquake. Recommended guidelines for determining the maximum probable earthquake as issued by the California Division of Mines and Geology (CDMG Note 43) state that the maximum probable earthquake is the maximum earthquake that is likely to occur during a 100-year interval and that is to be regarded as a probable occurrence. Among the criteria used in determining the maximum probable earthquake includes a review of the regional seismicity of the area in question, with the proviso that the postulated magnitude shall not be lower than the maximum that has occurred within historic time. A review of the seismic characteristics of the regional site area determined that the maximum probable earthquake should be derived from the active San Andreas Fault.

The active San Andreas Fault is approximately 3 miles from the facility, with the United States Geologic Survey (USGS) determining that the fault should have an estimated maximum credible magnitude earthquake of 8.5, with a recorded magnitude of the largest historic earthquake being 8.3 (Borcherdt, 1975). Using the fault distance versus rock acceleration chart prepared by Schnable and Seed (1973, see Figure 1A; 1972, see Figure 1B), the approximate bedrock acceleration at the site can be determined. Figure 1A represents the range of maximum accelerations in rock. Using a distance of 3 miles from the causative fault and the probable upper bound line as the maximum probable earthquake magnitude, a bedrock acceleration of 0.77g is determined. Figure 1B represents the average value of maximum accelerations in rock. Using a distance from the causative fault of 3 miles versus a magnitude of 8.5 earthquake, a bedrock acceleration of approximately 0.69g is determined.

As reported in a study by Ploessel and Slosson (1974), there has been considerable misunderstanding of the significance and proper utilization of maximum or peak acceleration. As reported, a single peak acceleration is not indicative of the entire range of anticipated ground motion and thus alone as a single data point, it is of little value in structural design. Page and others (1972) have noted that a single peak of intense motion (maximum or peak acceleration) may contribute less to the cumulative damage potential than several cycles of less intense shaking. Therefore, the concept of repeated high ground acceleration should be of greater concern in design rather than a single peak of maximum acceleration. Ploessel and Slosson (1974) indicate that the repeatable high ground acceleration value typically averages 65 percent of the peak ground acceleration for sites within 20+ miles of the epicenter. Since the cumulative effect of cyclical seismic acceleration is a more critical design factor than a single peak value, the repeatable high ground acceleration value represents a reasonable value for design consideration. Applying their reasonable high ground acceleration design value acceleration should be 0.50g and 0.45g (using Figure 1B).

The foregoing procedure for determination of the design seismic acceleration has been accepted by review agencies (e.g. RWQCB) at other California landfills.

5-60. The data in the EIS does not contain all the technical information available. Referenced technical reports need to be consulted when detailed evaluations are required.

The one-dimensional SHAKE program is commonly used for slope stability study and provides a reasonable conservative analysis. An example of the expected attenuation characteristics of landfills was described in the R.L. Vlope and Associates (RLV-A, 1985) study for the Kirby Canyon landfill in San Jose, California. The 200-foot design Kirby Canyon facility was similarly analyzed using the SHAKE program and calculated a 66 percent reduction of the bedrock acceleration value at the top of the landfill.

5-61. The attenuation of seismic energy through landfills has been demonstrated in several slope stability analyses, including the RLV-A (1985) study for Kirby Canyon described in Response 5-60. That study demonstrated a 66 percent effective reduction of a seismic acceleration from the base of landfill to the top.

Again, it must be emphasized that the overlying alluvium, colluvium and weathered bedrock would be excavated so that the ground-water collection system, the 5-foot subgrade barrier and 1-foot clay liner are founded on competent underlying bedrock. The analysis of these systems under seismic loading by D. S. Singh of Santa Clara University indicates that no integrity would be lost during a design magnitude earthquake.

5-62. The landfill, its water collection and diversion facilities and other containment systems are designed to withstand the maximum probable earthquake, magnitude 8.3 on the Richter scale.

The statement that "the affect of a large earthquake on Apanolio Canyon could be severe" is subjective. The landfill slope configuration, the LCRS and liner have been analyzed by accepted methodologies and found to resist the affects of the maximum probable earthquake as required by Subchapter 15. The technical basis for these conclusions are contained in the report of "Stability Analysis, Static and Dynamic Loading Conditions, Apanolio Canyon Expansion Site, Ox Mountain, Half Moon Bay, California" by Purcell, Rhoades and Associates, January 29, 1988.

5-63. The assumption to increase traffic volumes proportional to the population growth of an area in this case is probably conservative. The residential and open space nature of Half Moon Bay and adjacent coastal area does not indicate that commercial or industrial development is likely to occur at a magnitude that would shift Highway 92 traffic patterns substantially. The majority of the traffic congestion experienced on Highway 92 is associated with the morning eastbound commute (employees commuting from residential areas in the vicinity of Half Moon Bay to employment centers on the Bay side of the peninsula) and the evening westbound commute (return trips). Weekend congestion is primarily caused by recreational traffic accessing the coastal area via Highway 92. Changes in the development pattern in the Half Moon Bay area could impact traffic flow; however, employee commute trips originating from the Bay side would travel against the existing congested flow directions in that this would add to the eastbound traffic flow in the morning and the westbound traffic flow in the evening. In addition, employment opportunities developed in the coastal area may be filled by employees currently traveling to Bayside areas, potentially reducing vehicle trips during the current congestion periods. It would be more practical to evaluate traffic impacts related to a future project, as each project is considered by local agencies. Current restrictions and restrictions recommended by this EIS on truck traffic to

the Ox Mountain facility prevent landfill truck traffic from interfering or compounding existing traffic congestion during the commute periods on Highway 92.

The roadway improvements are scheduled for completion by 1995. Analysis of future traffic impacts on Highway 92 are presented for future years 1990, 2000, and 2010. Both the 1987 and 1990 traffic impacts are calculated assuming existing roadway conditions. The 2000 and 2010 analysis years assume these traffic lanes are present. In addition, a "worst case" analysis (without roadway improvements) for the 2000 and 2010 traffic conditions on Highway 92 are presented in Tables 3.4-2 and 3.4-3. Assuming improvements to Highway 92 are completed by 1995 (or before 2000), the capacity of Highway 92 would increase to 2,400 pce per hour. If these improvements do not occur, roadway capacity would remain at 1,400 pce per hour. If in fact, no improvements are made, LOS F conditions occur in the westbound and eastbound directions in 2000 and 2010.

As occurs now, the highest traffic flow would be during the 5 p.m. to 6 p.m. period for westbound lanes and 7 a.m. to 8 a.m. for eastbound lanes. LOS in both directions during all time periods drops to E with LOS F conditions during the a.m. and p.m. periods and 11 a.m. to 12 noon period westbound in 2010. Only one shift in LOS resulted from landfill traffic (Westbound, 11 a.m. - 12 noon, 2010), that being from LOS E to F.

5-64. Costs associated with potential mitigations for truck traffic impacts along Highway 92 would be similar for all alternatives. Road signage and pavement widening requirements would be similar for all alternative sites due to the common intersection location (either existing landfill access or quarry access). Inclusion of these costs would shift economic feasibility in the direction of longer life-span alternatives (i.e., long life-span sites provide a greater return on roadway improvement costs).

5-65. Increases in truck traffic to the Ox Mountain facility would be proportional to the increase in generation of solid wastes in San Mateo County. The facility would use the same access route currently used by the Ox Mountain Sanitary Landfill in Corinda Los Trancos Canyon. No noticeable changes in traffic would occur from project approval. For example, the projected increase in transfer truck traffic from 1990 to 2000 would be from 93 to 103 truck trips from the east of the Coast Range. This gradual increase would be small with respect to the overall anticipated volume of vehicle traffic on Highway 92 not related to landfill operation.

The noise analysis focused on the receptors most likely to be impacted by landfill activities (i.e., the residences near the facility in Apanolio Canyon). Receptors along Highway 92 (residences) would be subject to noise conditions as described in the "Traffic Noise" section of the EIS.

5-66. The population figures used in the EIS are from ABAG Projections '87. ABAG projections are widely accepted by Bay Area jurisdictions and planning agencies. These population numbers are generally weighted based on local planning policies.

5-67. A wind rose is not available for the project site. On a macrometeorologic scale, the project area exhibits the predominant west to east wind flow pattern common to the coastal regions of northern California. Actual wind flow patterns at the project site are also heavily influenced by site topographic features. In general, up-canyon flow during the day, and down-canyon flow during the evening hours should prevail at the project site.

5-68. For discussion of project air quality impacts from VOC emissions, see response to comment 2-4.

5-69. Vehicle traffic associated with the current Corinda Los Trancos Canyon landfill would be shifted to Apanolio Canyon. No significant increase in truck traffic is projected over current levels; therefore, air quality impacts associated with vehicle traffic would not be appreciably different than current impacts. For a discussion of VOC impacts, see response to comment 2-4.

5-70. Bay Area Air Quality Management District and the Minimum Standards for Solid Waste Handling and Disposal (Section 17705), Article 7, Chapter 3, Title 14, California Natural Resources Code) require landfill gas control. EMCON Associates is developing the design details of the methane recovery system. This recovery system will be designed to prevent fire risk, gas migration and hydrocarbon emissions, thus eliminating any impacts on the existing population and residential and commercial development in the proximity.

5-71. A landfill gas control system would be constructed to conform with the requirements of BAAQMD Rule 34. The system would be similar to the system currently in operation at the Corinda Los Trancos Canyon landfill. The control system would consist of vertical and/or horizontal collectors that would be piped to a processing/flare station.

The landfill gas control system would be thoroughly reviewed and approved by the BAAQMD as part of their normal permitting process. Potential methods of energy recovery include electrical generation or greenhouse heating, or the gas can be flared. The flares that are currently approved by BAAQMD typically produce small amounts of nitrogen oxides and carbon monoxide, the amounts depending on the rate of flow. BAAQMD typically requires that flares have a minimum of 0.3 second residence time at a minimum operating temperature of 1400°F. The gas collection system operating at the Corinda Los Trancos Canyon landfill has proven to be highly efficient and results in minimal fugitive landfill emissions.

5-72. The cover page of the Final EIS has been revised to meet 40 CFR requirements.

5-73. The list of preparers, Chapter 8.0, has been revised to meet 40 CFR requirements.

5-74. The structure of Chapter 5.0 of the EIS is intended to provide a comparative evaluation of alternatives by presenting environmental impacts for the applicant's preferred alternative and other defined alternatives. This information is presented by topic (e.g., geology, transportation, land use) to allow comparison of impacts. In addition, the information presented in Chapter 5.0 is summarized in a matrix presented in Chapter 1.0 of the EIS.

Responses - Comment Letter 6

6-1. The neighboring canyons referenced in this comment are presumed to be Corinda Los Trancos and Nuff Canyons. These canyons are modified from their natural state to various degrees through man's activities. The value of the habitat in all three canyons (Apanolio, Corinda Los Trancos and Nuff) varies with location within each of the respective canyons. The lower portion of Apanolio Canyon, to within 1,950 feet of the project area is occupied by residences and agricultural activities. In the project area, an unimproved (four-wheel drive) access route has been established within the canyon, as well as the along the upper perimeter of the canyon. Corinda Los Trancos Canyon is occupied at its northern end by the Ox Mountain Landfill and at its southern end by agricultural operations. A paved access route to the landfill extends along the center line of the lower canyon. Nuff Canyon is developed as a rock quarry in the southern portion with an access route connecting the quarry to Highway 92. The northern portion of this canyon is relatively undisturbed, being occupied by an abandoned cabin and small pasture areas.

From a value perspective, Apanolio Canyon habitat is undoubtedly of higher value than the adjacent canyons discussed above. However, the difference in value is largely subjective and is difficult to determine in a quantitative sense. The mitigation plan developed for the Apanolio Canyon 1,200-foot alternative is intended to create and enhance habitat areas to offset loss of habitat caused by landfill construction.

6-2. The alternatives carried through the EIS in detail, with the exception of the "No-Action" alternative, are similar in location, geology, and climate. This similarity results from the characteristics of San Mateo County both physically and socioeconomically. The development of a sanitary landfill requires location away from population centers and other conflicting land uses, while remaining accessible to its intended service area. The physical and land use characteristics of the County, when subjected to siting criteria, limits the potential development areas to remote canyon sites in the Coastal Range. Thus, all potentially viable alternative landfill sites are located in similar physical settings and geographical locations.

6-3. Additional discussion of out-of-county disposal procedures is presented in Section 3.3 of the EIS.

6-4. See above response to comment 6-3.

6-5. Selection of alternative landfill development sites was based on studies conducted in 1963 and 1987. These studies, and interaction with agencies and the public, identified numerous potential landfill locations within the County. The sites that were considered the most practicable were

carried through the EIS in detail. It is not the intent, nor the purpose of the EIS to bias the environmental analysis based on previous decisions or proposals. The EIS provides a comparison of the impacts that would be associated with each of the landfill development alternatives.

6-6. Additional discussion of out-of-county disposal at Altamont and recycling programs and goals are provided in EIS sections 3.3 and 3.5e, respectively. The potential development options for Nuff Canyon also are discussed in Section 3.3.

6-7. The habitat values in Nuff Canyon are lower than those found in Apanolio Canyon, however, these habitats are of relatively high value in the area proposed for landfill development within Nuff Canyon. Therefore, this difference in habitat value is probably not of a significance that precludes consideration of other resource/land use impact areas. Development of a landfill in Nuff Canyon, although practicable, could be more difficult from a geologic and leachate containment perspective (see Project Description, Geology, etc.). The land use conflict with quarry operations and safety issues related to this conflict would further inhibit development of this site. Traffic mitigations that could reduce the potential impacts from joint use of Nuff Canyon are presented in the EIS.

6-8 The Mitigation Plan is intended to provide mitigation for the continuous flowing stream that would be lost in the project site. The upper reaches of Apanolio Creek apparently do not support steelhead; only a resident rainbow trout population is present (see Tom Payne report in Appendix B). To compensate for loss of fishery habitat, the Plan provides enhancement of several streams in the project area and extensive stream improvements in Corinda Los Trancos Canyon.

The mitigation component proposing to remove downstream barriers in Apanolio Creek was eliminated because property owner permission could not be obtained.

See response to comment 5-21 for discussion of "piecemeal mitigation".

The management of the Pilarcitos basin may be incomplete and improper. BFI recognizes this as an opportunity to correct structures that currently prevent steelhead migration on several streams. The Mitigation Plan provides for correction of these situations in an effort to restore previous and potential habitat to compensate for the losses in Apanolio Creek. Without implementation of the proposed mitigation, correction of mismanagement on these stream courses may not occur.

BFI would monitor the mitigation projects in Corinda Los Trancos yearly for 5 years, after which monitoring would take place only after severe flood years. Certain mitigation projects would also be protected by a deeded

conservation easement in perpetuity: water development ponds, fish enhancement within the creek, bank stabilization plantings, and riparian development along the creek (see Mitigation Plan, Appendix B).

See response to comment 5-23 concerning the proposed burn program.

6-9. The Mitigation Plan proposes a reasonable mitigation program of which the cost is irrelevant if the plan is adequate. For comparison of mitigation costs for alternatives, see response to comment 22-17.

6-10. Table 3.4-3 compares the cost of disposal at the existing Ox Mountain facility with estimated costs for out-of-county disposal. The last column (far right) of the table represents the estimated cost increase associated with out-of-county disposal for each scavenger company operating in San Mateo County. Table 3.4-4 provides a summary of the total increase of costs. Also see response to comment 5-15.

6-11. The long-term productivity of the site would be modified from the existing use of the site (i.e., wetland, riparian, and stream habitat). Operation of the landfill would preclude or reduce use of the site by wildlife until closure of the facility and revegetation of the site was complete. At that time, wildlife habitat, although different from those occurring at the site now, would be created. Any loss of habitat (e.g., fishery, riparian) would be compensated for through enhancement and restoration projects outlined in the Mitigation Plan. The intent of this plan is to mitigate any potential habitat loss with habitat of equal value and quantity. In many cases, mitigation elements would be installed prior to loss of habitat.

A landfill site having a projected life-span of nearly 100 years is not viewed by the County or the waste management business as a short-term solution. Landfill capacity of this magnitude would allow the County to continue to investigate alternative technologies and recycling in a planned, well thought out manner. Any future reduction in landfill loading through waste stream reduction could potentially extend the life of the 1,200-foot alternative beyond the 100-year life-span.

6-12. Additional information has been presented for the potential alternatives identified by the 1987 siting study. This information is presented in Section 3.3 of the EIS. Additional information also has been incorporated for the proposed alternatives (i.e., Apanolio Canyon, Corinda Los Trancos Canyon, and Nuff Canyon). Information updated includes a finalized San Francisco garter snake study, fisheries evaluation for Apanolio Creek, and wetland analyses for Corinda Los Trancos and Nuff Canyons. Technical appendices have been expanded and other additions to the EIS text appear in italic print throughout the document.

Responses - Comment Letter 7

7- Comment noted.

Responses - Comment Letter 8

8-1. At the time of the Department of Fish and Game study, no conclusive decision had been made with regard to the full effectiveness of the barriers in preventing steelhead from accessing the northern portion of Apanolio Creek. Since that study, it has been determined that based on the data available, the barriers are indeed effective and that only resident rainbow trout inhabit this portion of the creek. See response to comment 5-22.

8-2. There are no anticipated cumulative long-term adverse impacts to the rainbow trout fishery due to the project. An augmentation program to insure protection of summer low stream flows has been developed for Apanolio Creek. In addition, it is estimated that the development of the landfill, by virtue of the sedimentation basin, would reduce the yield of sand and silts into lower Apanolio Creek. The enhancement of Corinda Los Trancos Creek, along with other fishery mitigation measures proposed in the Mitigation Plan (Appendix B), is intended to prevent a loss of fishery habitat. An invertebrate study was conducted for stream reaches in Apanolio, Corinda Los Trancos, and Pilarcitos Creeks (see study Appendix B).

8-3. The landfill underdrain is not intended to serve as fishery or aquatic habitat. This structure is designed to convey surface water from above the landfill to the sedimentation basin below the toe of the landfill. The mitigation measures proposed for the project are intended to replace all loss of fishery and aquatic habitat that would result from landfill construction.

8-4. Clearing activities and other associated construction would result in temporary adverse impacts only within the project area. Construction activities would begin with the development of an interim sedimentation control system. This system would temporarily control sediment during construction of the permanent sediment control system. The increase in suspended silt would be closely monitored and effectively trapped within the sedimentation systems. Turbidity may be increased due to clay particles that cannot be completely trapped in the sedimentation basins. See response to comment 5-39. Previous construction activities in Apanolio Canyon have contributed to the high sediment load that occurs in Apanolio Creek. Natural landslides, slips, and streambank erosion also are sources of sediment for the high bedload observed in Apanolio Creek.

8-5. The proposed project would not be anticipated to have long-term adverse impacts to the fishery resources in the project area or anadromous fish populations. The resident trout habitat eliminated would be compensated for (at greater than 1:1) via the mitigation plan which, among other measures, provides for enhancement and restoration of Corinda Los Trancos Creek as a steelhead stream.

Section 1700 of the California Fish and Game Code encourages conservation of the state's waters for the benefit of all citizens. This law is a guideline to be used in the decision-making process with other public interest issues, such as solid waste disposal. Therefore, the Apanolio Canyon site provides a suitable solid waste disposal site with no habitat loss, no species endangerment and no adverse effects when evaluated with the Mitigation Plan.

8-6. The proposed project in Apanolio Canyon, when viewed with proposed mitigation measures for wildlife and fisheries, streamflow augmentation, and contingency remedial actions, would not be anticipated to adversely impact downstream habitat or fishery value. A study conducted by Mr. Thomas Payne (Appendix B) concluded that the fish population in the project area is resident rainbow trout; therefore, it is not currently a steelhead fishery. Since no downstream fishery habitat impacts are anticipated, there would be no impact to steelhead trout populations. In addition, Sections 1600-1606 of the Fish and Game Code contain provisions for the Department to influence development activities to prevent or minimize impact to fish and wildlife resources. The Mitigation Plan for the Apanolio Canyon project has been reviewed by Fish and Game staff.

8-7. Adverse impacts to beneficial uses of Apanolio Creek below the BFI property boundary would not be anticipated. Through streamflow augmentation and contingency remedial action plan measures, no adverse impact to downstream surface or ground-water is anticipated. Thus, the only impact to fisheries would be the elimination of 4,649 feet of resident rainbow trout habitat within the project site. Resident trout fishery impacts are intended to be offset by the proposed mitigation plan's fishery enhancement projects.

8-8. The proposed landfill would eliminate approximately 4,649 feet of resident rainbow trout fishery in Apanolio Creek. Although changes in the duration of flood flows in Apanolio Creek would occur because of the landfill's stormwater management system design, the anticipated reduction in low summer flows would be mitigated through a streamflow augmentation plan (see Appendix D). Thus, the project would not violate provisions contained in Section 275 of the Water Code.

8-9. The comment regarding the filing and withdrawal of an application to the California Division of Water Rights is correct. At the time the application was withdrawn, BFI did not contemplate the need to appropriate any water. BFI has filed an application with the California Division of Water Rights for appropriation of water from Corinda Los Trancos Creek.

8-10. BFI has applied for for water rights associated with the proposed streamflow augmentation program for Apanolio Creek. Thus, the project would not be in violation of Sections 102 and 105 of the California Water Code.

8-11. Section 5948 of the California Fish and Game Code provides that it is illegal to construct an artificial barrier, except a dam for storage or diversion of water or obstruction permitted by law, in any stream which will prevent the passing of fish up and down the stream or which will be deleterious to fish as determined by the Fish and Game Commission. Aside from the fact that the project does not fit within the purview of section 5948, sections 1601 and 1603 of the Fish and Game Code provide for the permitting of stream bed alteration and modification of flow by the Department of Fish and Game. BFI is complying with the section 1601-1603 permit process and thus, neither those sections nor section 5948 will be violated.

8-12. See response to comment 5-6 for additional information on the San Francisco garter snake.

8-13. Section 1755 of the California Fish and Game Code sets forth general State policies concerning the maintenance of sufficient populations of wildlife and habitat to ensure their continued existence. This section does not contain any prohibitions. The mitigation plan proposed by BFI is intended to provide habitat in excess of that which would be destroyed by the project. In addition, the plan would provide for potential increase in fish populations. Thus, the policy considerations contained in section 1755 would be met.

8-14. There would be no streamflow reduction in Apanolio Creek during critical low flow periods. The streamflow augmentation plan (see Appendix D) provides for maintenance of low flows within Apanolio Creek. Adverse impact to the resident rainbow trout habitat below the landfill site would not be expected. Maintenance of critical low flows as well as decrease of sediment loads due to installation of the sedimentation basins should prevent degradation of downstream fishery habitat values. See responses to comments 5-7 and 5-21.

8-15. The streamflow augmentation and contingency remedial action plans developed for the proposed project are intended to protect both downstream water quality and quantity. The augmentation program, presented in Appendix D, would provide for maintenance of summer low flows in Apanolio Creek, thus preventing adverse impacts to downstream users or fishery habitat. Implementation of this plan would ensure no reduction in existing summer low flows in Apanolio Creek at the BFI property line. It is beyond BFI's responsibility or capability to ensure flows below the diversion structures on Mr. Bongard's property.

8-16. There would be no reduction in streamflow during critical low flow periods in Apanolio Creek. There also would be no anticipated adverse effects to the resident trout population downstream from the proposed project. Information and evaluation of existing data from site-specific fishery studies is contained in a report prepared by Mr. Tom Payne (see Appendix B). See response to comment 5-22.

8-17. Low flows in Apanolio Creek at the BFI property boundary would remain the same as before the project due to stream flow augmentation. Loss of downstream resident rainbow trout habitat due to reductions in streamflow would not occur. Since no modification of existing low flows would occur, IFIM studies are not necessary. See also response to comment 5-22. Protection of fishery habitat below Mr. Bongard's diversion cannot be guaranteed by BFI, since they do not control this diversion structure or other downstream withdrawals of water.

8-18. The proposed project would not violate the county objective to protect and conserve vegetation, water, fish and wildlife resources. The Mitigation Plan developed for the project is intended to provide for no net loss of habitat, water quality or quantity.

8-19. The proposed project would not violate the county objective to protect and enhance the scenic quality of county lands. The county has designated the Apanolio Canyon site as its long-term landfill location.

8-20. The State Water Resources Control Board is providing review of the fishery and in-stream protection measures. The Board, along with other agencies, is reviewing and commenting on the Mitigation Plan. In reviewing and commenting on the Mitigation Plan, the Board will uphold its responsibility to protect the public trust.

8-21. The project would not place the state's waters and beneficial uses of the waters at environmental risk. The state's waters would be protected by the Mitigation Plan (see Appendix B), streamflow augmentation plan, and the Contingency Remedial Action Plan (see Appendix D). The project would not eliminate a steelhead fishery (see response 5-22) in Apanolio Creek, and following mitigation, a steelhead fishery would be created in Corinda Los Trancos Creek. Through review and development of waste discharge requirements, the Regional Water Quality Control Board will insure protection of the state's waters. Augmentation of critical low summer flows would protect downstream beneficial uses dependent upon these flows.

8-22. The alternative sites evaluated in the EIS were arrived upon through a rigorous effort to identify and screen potential sites within San Mateo County for development of a sanitary landfill. A long process of siting studies and agency/public interaction has failed to identify any potentially viable alternatives other than those presented in the EIS. The alternatives that appeared most feasible, while potentially reducing the magnitude of impacts, were carried through the detailed EIS evaluation.

Use of sites currently in operation with San Mateo County would divert the flow of 91.5 percent of the County's waste stream from Ox Mountain to two other smaller landfills (Hillside and San Mateo). This diversion would create increased traffic, air emissions, and noise in the vicinity of these landfills. Additionally, diversion of 673,400 tons/year of solid wastes to these facilities would quickly exhaust their capacity.

8-23. The proposed project would not eliminate a viable steelhead stream. The 4,649 feet of Apanolio Creek eliminated supports a resident trout population (see Tom Payne report - Appendix B). See response to comment 5-5.

Responses - Comment Letter 9

9-1. In the event that it became necessary to provide an alternative drinking water source for residents of Digges Canyon from the Coastside County Water District (CCWD), BFI would work with the Local Enforcement Agency (County of San Mateo) to quickly obtain an emergency permit for construction of a water supply pipeline and distribution network to the affected residences. Thereafter, an application for permanent water rights would be obtained by BFI. The components of the draft contingency remedial action plan are presented in Appendix D.

9-2. Protection of surface and ground-water resources downstream from the project site would be provided through mitigation/protection measures outlined for the project. Summer low flows in Apanolio Creek would be maintained through streamflow augmentation (see Appendix D). Protection of water quality should degradation of water resources occur below or downstream from the toe of the landfill would be provided through actions outlined in the Contingency Remedial Action Plan contained in Appendix D.

9-3. Purcell, Rhoades & Associates, reaffirms its report entitled, "Revised Hydrogeological Assessment and Water Resources Beneficial Usage Analysis", dated May 16, 1988. The amount of water held in storage in the private reservoir, according to Mr. Bongard, does not agree with the results of the hydrogeologic measurements within Apanolio Creek.

9-4. Mr. Bongard has not given permission for implementation of mitigation measures on his property. Therefore, those proposed mitigations have been removed from the Mitigation Plan. Written permission has been received from all other property owners involved with mitigation components. These letters are on file at BFI's San Carlos office.

9-5. The Draft EIS evaluated numerous potential landfill sites within San Mateo County. Potential sites, representing the total array of sites, were screened using various criteria to determine those with "fatal flaws" that would preclude or inhibit development of the site as a sanitary landfill. The sites that appeared more viable were evaluated at a greater level of detail, and those potentially reducing impacts associated with the proposed action were carried through the EIS as alternatives. As revealed by the EIS, the landfill alternatives impact resources in different ways and at different magnitudes.

9-6. A survey of property sales in the vicinity of the Ox Mountain Sanitary Landfill does not indicate that property values have been adversely affected by the presence of this facility. See response to comment 5-15 for additional information.

Responses - Comment Letter 10

10-1. Comment noted. See response to the Northern California Council Federation of Fly-Fishers (NCCFFF) letter (comments 16-1 to 16-15) and the California Sportfishing Protective Alliance (CSPA) letter (comments 8-1 to 8-23).

Responses - Comment Letter 11

11-1. Depletion of, or future access to, the mineral resource resulting from construction of a landfill in northern Nuff Canyon is discussed in the EIS. Without implementation of proper mitigations, the congestion created by the combined traffic of the landfill and quarry would create a potential safety problem both in the canyon and at the Highway 92 intersection. These potential impacts are also discussed in the EIS.

Responses - Comment Letter 12

12-1. See response to comment 5-15 regarding property value impacts.

12-2. The wildlife habitat value of the proposed landfill development area within Nuff Canyon is relatively high. The northern portion of this canyon is relatively undisturbed compared to the active quarry area in the southern portion of the canyon. However, the relative comparison of habitat value is lower than that of Apanolio Canyon.

12-3. Streamflow data collected by PRA since August, 1988 indicated that Apanolio, Corinda Los Trancos, and Nuff Creeks have maintained flows; although flows are very low. Even in this relatively dry season, flows in these three streams ranged from 0.0002 to 0.005 cfs, 0.0004 to 0.0015 cfs, and 0.011 to 0.042 cfs respectively. To ensure maintenance of existing stream flows, BFI has proposed mitigation measures to provide augmentation of stream low flow in Apanolio Creek. This mitigation would ensure existing flows; however, downstream diversions by water users cannot be controlled by BFI. Therefore, augmentation of stream flows can only be guaranteed within and at the BFI property line.

12-4. The design of the leachate collection and removal system (LCRS) represents the current state-of-the-art and complies with the stringent requirements of Subchapter 15 regulations. The LCRS is discussed in a Purcell, Rhoades & Associates report contained in Appendix D. Requirements of quarterly ground- and surface-water monitoring would assure early detection in the unlikely event that leachate migrated into Apanolio Creek or the lower canyon aquifer. A draft contingency plan, in the event contamination did occur, is outlined in Appendix D.

Responses - Comment Letter 13

13-1. The Waste Discharge Orders for the site call for quarterly surface- and ground-water sampling. Analysis results would provide the operator and regulators with early detection of any degradation of water quality resulting from the landfill. The County of San Mateo Department of Health would review water analysis results and determine what effects any identified pollutants might have on human beings. If it is determined that water quality was being impacted by landfill operation, remedial actions would be triggered as outlined in the "Draft Contingency Remedial Action Plan" contained in Appendix D.

13-2. San Mateo County contacts with Michael Machtigal, Chief Microbiologist for San Mateo County indicate that microorganisms could not survive the harsh environment of a landfill. Clay is used as a barrier to absorb microorganisms in microbiology/bacteriology laboratories. Likewise, if microorganisms were to survive the high internal temperatures in a landfill, they would ultimately get trapped in the clay layer and breakdown.

Responses - Comment Letter 14

14-1. Information regarding the potential for out-of-county disposal of San Mateo County solid wastes is provided in Section 3-3 of the EIS.

14-2. Potential alternatives for reduction of the waste stream being landfilled are presented in Section 3.5e of the EIS. From this discussion, the only feasible alternative at this time would seem to be resource recycling combined with landfilling. The estimated 35 percent reduction (San Mateo County goal), or diversion, of the waste stream from the landfill would extend the life-span of the various alternatives by approximately 20 percent. It is apparent that even with effective recycling efforts, the volume of solid wastes requiring disposal makes establishment of a large-capacity site desirable for San Mateo County.

14-3. Comment noted. The Contingency Plan developed for the project identifies remedial actions to be implemented should degradation of ground or surface waters occur beneath or downstream from the landfill. Appropriate action taken to prevent movement of contaminants from the site would indirectly protect fish and wildlife resources.

14-4. San Mateo County has been pursuing the possibility of exporting their solid wastes to an out-of-county facility. Correspondence with Alameda and Santa Clara Counties and the City of San Jose have indicated that this type of solution would be problematic and in any event require an amount of time probably in excess of current in-county landfill capacity. County attempts to identify additional in-county sites (i.e., sites not evaluated by previous siting studies) have been unsuccessful. Agency and public scoping associated with the EIR and EIS for the Ox Mountain facility have failed to identify a potentially viable alternative other than those already investigated. The County is actively pursuing a county-wide recycling program (see Section 3.5e).

14-5. The report prepared by Mr. Tom Payne (see Appendix B) was developed based on a review of all information available from previous BFI and agency studies. This report concludes that the existing fishery should be considered resident rainbow trout. The stream's steelhead potential is impeded by a downstream barrier on private property. This property owner has indicated that he would not give approval for mitigation measures to correct this barrier. The Mitigation Plan developed for the project provides measures for enhancement of other potential steelhead streams, including an extensive enhancement of Corinda Los Trancos Creek.

14-6. See response to comment 14-5 regarding the steelhead fishery potential. The report prepared by Mr. Tom Payne also discuss the potential for fish passage of the existing downstream barrier. Estimates of flow characteristics at the barrier are provided in a report prepared by Hydrocomp, Inc. (Appendix B). Calculations contained in this report use flood year conditions and should not be representative of drought conditions.

14-7. The Mitigation Plan is intended to provide for no net loss of habitat or habitat values. The anticipated decrease in summer flows in Apanolio would not occur due to flow augmentation (see response to comment 5-22). The permanent loss of riparian and fisheries habitat including pools and riffles is intended to be compensated for by the proposed mitigation. On-site, in-kind mitigation is not feasible in Apanolio Canyon (see response to comment 5-21).

14-8. See response to comment 5-19 regarding the habitat evaluation methodology.

14-9. The Mitigation Plan components are intended to provide complete compensation for the in-stream habitat lost in Apanolio Creek. The mitigation for the project occurs in many different areas because complete on-site, in-kind, mitigation is not possible within the Apanolio Creek watershed. For more comments on the mitigation being "piecemeal," see comment 5-21.

14-10. The Mitigation Plan includes replanting of the entire exposed slope of the landfill. Slope stabilization can be achieved through many methods. The selection of species of grasses and forbes that have high seed production and provide good cover to birds is done solely for the benefit of wildlife.

The sediment ponds are integral to the development of the mitigation project. Revegetation of the perimeter would not be required for maintenance and may be an impediment to the convenient maintenance of the ponds. BFI is committed to maintain the vegetation for wildlife benefit. See response to comment 5-23.

14-11. The structures proposed for the undisturbed portions of Apanolio Creek are for low flow enhancement only. Each of these structures is approximately 4 feet wide and 8 inches high. The pool and associated cover would be about 1 to 2 square feet in size. No vegetation would be removed during installation and winter flows would not be impeded or altered by these low flow structures.

14-12. The barriers proposed for modification have been identified by the California Department of Fish and Game. Each has been determined to be an effective barrier to anadromous fish migration. The Mitigation Plan is intended to provide passage facilities allowing effective and efficient fish migration. Construction of the proposed modifications would create very little and only temporary disturbance.

14-13. The Mitigation Plan intends for the deflectors to concentrate low flows between winter storm events. This would allow habitat values of the fishery to increase due to free passage capability during the entire winter migration period.

Prescribed burning would not be necessary for landfill management. The prescribed burn program, by virtue of its implementation, is intended to enhance wildlife values. The burn program would be conducted within the Apanolio and Corinda Los Trancos drainages. See response to comment 5-23.

Responses - Comment Letter 15

15-1. The issues evaluated by the Corps EIS do not rely upon the business record of BFI. The issues discussed are focused on the physical and socioeconomic impacts of development of a landfill in Apanolio Canyon or one of the alternative sites. However, the performance record achieved by BFI does indicate a high level of professional responsibility regarding compliance with permit requirements and sensitivity to public concerns.

15-2. During the time the DEIS was being prepared, the California Department of Fish and Game had not come to a conclusion regarding the presence of steelhead in Apanolio Creek. Comments were received from CDFG on the DEIS regarding the status of fisheries in Apanolio Creek (see comment letter 34). These comments indicated that the fish population should be considered both steelhead and resident sub-populations. Based on a study conducted by Mr. Thomas Payne, (see response 5-22 and Appendix B) it has been determined that fish population in Apanolio Creek should be considered resident rainbow trout. This study concluded that barriers downstream from the project site appear to be impassable to migrating fish.

15-3. San Mateo County has designated the Apanolio Canyon site to be used for sanitary landfill development. If this development is prevented, potential future uses of the site could conflict with any future attempts to develop the canyon for landfill purposes.

15-4. It is understood, and presented in the traffic section of the EIS, that Ox Mountain truck traffic impacts the traffic flow patterns on Highway 92. Trucks of all types, especially fully loaded, impact Highway 92 traffic; however, restrictions placed on access to the Ox Mountain Sanitary Landfill reduce the potential for these slower moving landfill vehicles to impact traffic at peak periods.

15-5. The references to litter problems experienced in San Mateo County are not intended to justify Apanolio Canyon as the specific landfill site for the County. These references simply serve to emphasize the need to identify and develop an adequate disposal location for San Mateo County solid wastes to help prevent litter problems.

15-6. San Mateo County is supportive of the Apanolio Canyon site and has supported this site for many years. Statements of long-term support and preference are intended to enforce the County's position in support of the site. These statements will be considered in context with other issues and impacts identified in the EIS when the Corps considers the Section 404 action.

15-7. Discussion of landfill development options in N. ff Canyon is presented in Section 3.3 of the EIS.

15-8. In a written communication to the U.S. Army Corps of Engineers, the Mayor of Half Moon Bay, on behalf of the City Council of the City of Half Moon Bay, offered support for the proposed Apanolio Canyon expansion (letter from Naomi Patridge, Mayor to Col. Galen Yanagahara, District Engineer, dated September 6, 1988).

Responses - Comment Letter 16

16-1. The discussion of potential landfill sites within San Mateo County has been expanded. This additional text is provided in Section 3.3 of the EIS. No additional potential landfill sites have been identified since publication of the DEIS.

16-2. Landfill siting studies have not identified any locations not presented in the EIS. Selection of the Corinda Los Trancos Canyon and Nuff Canyon as project alternatives was based on the appearance that these sites may be practicable while potentially reducing the impact to the natural environment. When considering potentially lower impact sites, all impacts ranging from socioeconomics to physical resources need to be considered.

Information regarding export of San Mateo County solid wastes is provided in Section 3.3 of the EIS.

16-3. Recycling efforts are currently underway in San Mateo County and plans have been developed to expand these efforts. Discussion of current and proposed recycling programs is presented in Section 3.5e of the EIS.

16-4. The identification of and planning for Apanolio Canyon as the County's solid waste disposal site should not be considered short-term. In view of the sanitary landfill situation across the state, a 93-year disposal site should be considered a long-term site. Potential for failure of any of the landfill components is the basis for the stringent engineering design and development of a contingency remedial action plan. Potential for failure would exist at any site developed as a sanitary landfill; therefore, consideration of this factor would not necessarily lead to preference of another potential site.

16-5. Over appropriation or mismanagement of stream flows within the Pilarcitos drainage is not under the control of BFI. The intent of the mitigation package is to compensate for habitat losses in Apanolio Canyon caused by landfill construction.

Based on studies conducted to date, the fish population above the Bongard diversion and in the project area of Apanolio Creek appear to be resident rainbow trout. Therefore, project construction is not anticipated to impact steelhead fishery habitat. Any reduction in Apanolio Creek flows would be mitigated through augmentation, thus preventing any impact to fisheries within the creek below the project area. To compensate for loss of fishery habitat, the Mitigation Plan provides measures to enhance fishery habitat, including projects in Corinda Los Trancos Creek.

Streamflow data collected by PRA during August, 1988 indicated that Apanolio, Corinda Los Trancos, and Nuff Creek flow ranged from 0.0002 to 0.005 cfs, 0.0004 to 0.0015 cfs, and 0.011 to 0.042 cfs respectively.

16-6. See response to comments 8-17 and 5-22. An invertebrate study was conducted for stream segments in Apanolio, Corinda Los Trancos, and Pilarcitos Creeks. This study is presented in Appendix B. Study results indicate that invertebrate populations are similar at all sites sampled, and could provide trout habitat if other physical conditions are provided. With the proposed enhancement of Corinda Los Trancos Creek and the protection of summer low flows in Apanolio Creek, in combination with other stream enhancement projects, no net loss of trout habitat would be expected.

16-7. A study of all fishery information available by Mr. Tom Payne concluded that the fishery in the upper reaches of Apanolio Creek, above the Bongard diversions, should be considered resident rainbow trout. Proposals by BFI to modify downstream barriers to fish migration have been refused by property owners. Therefore, BFI has proposed to enhance a portion of Corinda Los Trancos Creek and other watersheds in the project area (see Mitigation Plan). Also see response to comment 5-22 for additional discussion of fisheries.

16-8. Fishery surveys in the project area have been conducted by BFI and CDFG. In the DEIS, the impact to the fishery in Apanolio Creek was defined as being the elimination of 3,676 feet of fish producing stream. This number did not include a 1,018-foot segment of stream between the end of the sediment basin and the BFI property line that would not be eliminated by the project, nor did this number include a 595-foot segment of Apanolio Creek above an existing access road crossing and the natural waterfall barrier. Surveys by BFI and CDFG did not indicate the presence of fish in this upper reach of the creek as confirmed in the Department's letter dated July 25, 1988 (see letter 34, Section 9.4).

These numbers have been revised based on additional landfill design information. The sediment basin's outfall structure would extend approximately 378 feet beyond the southern portion of the basin. Thus, instead of avoiding 1,018 feet of stream as stated above, only 640 feet of stream would not be eliminated. In addition, even though fish were never observed in the 595-foot segment of creek below the natural waterfall, this stream footage could potentially support a fishery. Therefore, given these modifications, the proposed project would eliminate 4,649 feet of resident rainbow trout fish habitat.

Further analysis by Mr. Thomas Payne (see Appendix B) indicated that fish populations are most likely rainbow trout. As stated in this letter to CDFG, June 17, 1988 "From this information it can be concluded there exists in the area to be affected by BFI's landfill project, a resident Salmo gairdneri population that has the capability of reproducing itself."

16-9. The streambank revegetation program identifies locations in Pilarcitos Creek which would provide the necessary shade and cover for the stream course. Water quality would be maintained or enhanced with full bank

stabilization realized from the physical structures (riprap) and the trees that would be planted. Water quantity would not be impacted except by the small amount of water consumed by the plant materials established along the stream course. Bypass flows from Stone Dam are not a part of this proposal.

A Streambed Alteration Agreement does exist between Caltrans and CDFG for modification of this barrier; however, correction of this structure has yet to occur. BFI has proposed, and has reached an agreement with Caltrans, to correct this low flow migration barrier. This correction would provide consistent winter access to approximately 18,000 feet of Pilarcitos Creek. Without this mitigation measure, the Mitigation Plan would still provide 35,040 feet of recovered fishery for a net gain of 30,391 feet (654 percent gain).

16-10. Modification of the barriers on the Bongard property are not part of the Mitigation Plan. Future modification of these barriers is speculative since they are located on private property and would require landowner cooperation. Discussion of the fish population above these barriers is provided in response 5-22. For discussion of the hydrologic conditions to support the weirs which would be located in Apanolio Creek, see response 14-11.

16-11. Proposed Mitigation on Arroyo Leon Creek would provide consistent winter low flow access to upper reaches of the creek. The area proposed for enhancement in Arroyo Leon Creek is above any water diversion structure; therefore, withdrawal of natural flows does not occur in these upper reaches. Based on this, augmentation through purchase of water rights is not proposed. The effectiveness of the barrier (culvert) has recently been reconfirmed by Mr. Wooster of the California Department of Fish and Game.

16-12. The fishery in San Pedro Creek is a viable fishery and is now being enhanced by citizens' groups as well as agencies. BFI is proposing to modify a structure which has been identified as a barrier in this viable anadromous fishery. The intent of the proposed mitigation would be to enhance recognized steelhead habitat as partial compensation for elimination of resident rainbow trout habitat of Apanolio Creek. See response to comment 5-22.

16-13. The Mitigation Plan is intended to provide for full compensation of fish and wildlife values. The Plan addresses maintenance of rearing habitat during summer low flows in Apanolio Creek.

16-14. Millions of dollars may be available from the state and or other agencies for fisheries and other habitat improvements. To date the expenditure of these funds has not occurred except on a very minimal basis. The Proposed 1987-88 Proposition 19 Program consists of 89 projects for a total expenditure of \$1,971,300. Only \$30,000 for upper San Pedro Creek was allocated for San Mateo County. The public funds are not available at this time.

16-15. This project would not set a precedent for the filling of a steelhead stream since Apanolio Creek is apparently not a steelhead stream within the project area (see response to comment 5-22). In addition, streamflow augmentation and development of contingency remedial action in the event of leachate migration from the landfill would protect both downstream water quantity and quality. Thus, impacts to beneficial uses in the Apanolio and Pilarcitos Creek watersheds are not anticipated.

Responses - Comment Letter 17

17-1. The leachate collection and removal system is further discussed in a report prepared by Purcell, Rhoades & Associates which is contained in Appendix D. Evaluation of monitoring well data in Corinda Los Trancos Canyon indicates that leachate from the existing landfill has not leaked downgradient or downstream.

17-2. Currently, the Sewer Authority Mid-Coastside (SAM) is disposing of approximately 160 cubic yards per month of dewatered sewage sludge at the Ox Mountain facility. The material has been tested and has a solids content within the limits required by the operator's Waste Discharge Orders. It is anticipated that a similar quantity of sludge would be disposed of at the proposed Apanolio Canyon Expansion site in the future. As with the existing disposal, future disposal would require the sludge solid content be within the requirements of Waste Discharge Orders prepared by the RWQCB.

17-3. A minor surface spill of leachate at the leachate holding tank has been determined to be the source of contaminants found in an adjacent monitoring well. No leachate was found in the leachate monitoring well upgradient from this location which also is located in the path of any potential leachate migration. Therefore, there is no evidence that any failure of the leachate containment system has occurred at the Corinda Los Trancos Canyon landfill. Also see response to comment 5-37.

17-4. The proposed Apanolio Canyon project would occupy approximately 285 acres within the Apanolio Creek watershed. The Apanolio Creek watershed comprises 1,346 acres (17.7 percent) of the 7,590 acre watershed that contributes flow to lower Pilarcitos Creek (see Section 4.2, Hydrology and Water Quality). Thus, the landfill area would directly occupy an estimated 3.8 percent of the lower Pilarcitos Creek drainage area; however, ground and surface water flows upgradient from the landfill would be diverted to Apanolio Creek, below the landfill toe. Apanolio Creek summer low flows would be augmented and ground-water recharge wells would be installed to ensure no loss of downstream beneficial uses of surface or ground-water resources.

17-5. Water Quality Protection Standards (WQPS) have been developed for both the Corinda Los Trancos Canyon landfill and the Apanolio Canyon Expansion Site and are on record at the RWQCB. The Ranch House well that would be used as a domestic water supply (not drinking water) has been tested since the site was first developed and those water quality results are considered as part of the WQPS. Information indicates that this well has been contaminated by old creosote treated wood upgradient and near the well. Quarterly sampling of ground water for Corinda Los Trancos Landfill monitoring is ongoing and results show that the landfill containment systems are completely operational and performing as designed. Also see response to comment 5-37.

17-6. Protection of surface and ground-water in Apanolio Canyon is the intent of the state-of-the-art engineered design of the facility. However, the anticipated reduction in summer low flows in the later stages of landfill development and any potential for uncontrolled release of leachate into the environment must be mitigated. These potential impacts have been mitigated through a streamflow augmentation program (see Mitigation Plan - Appendix B) and development of a Contingency Remedial Action Plan (see Appendix D). These plans outline the strategy and actions to prevent future impacts to water resources.

17-7. The Corinda Los Trancos landfill was designed and operated prior to the adoption of Subchapter 15 regulations. There is no evidence that indicates leachate is leaking from the landfill. Apanolio Canyon Expansion Site Plans would conform to stringent requirements of the Subchapter 15 regulations.

The landfill subgrade barrier and liner system designed for the Apanolio Canyon expansion site is a state-of-the-art design and would be expected to perform as designed over the life of the project. If system failure were to occur, a Contingency Remedial Action Plan is provided (see Appendix D). It includes plans for mitigation of lost beneficial uses of ground and surface waters. Also see response to comment 5-41.

17-8. No additional capacity would be required to adequately handle treatment of leachate from the Ox Mountain facility. Therefore, no additional capacity is being held aside or reserved for BFI's future needs. Leachate disposed of at the SAM treatment plant must not contain chemical constituents exceeding limits defined in the Industrial Waste Ordinance. It should be noted that any pretreatment of leachate that may be required in order to meet allowable concentration levels, would be the responsibility of BFI.

Currently the landfill does accept sewage sludge from SAM at a rate of 160 cubic yards per month (1,920 cubic yards annually). This sludge does contain approximately 20 percent solids. Future requirements for sludge testing for disposal are currently being evaluated by state and federal agencies. When future protocol is determined, the requirements for sludge composition can be compared to SAM sludge content. Also see response to comment 17-2.

17-9. Leachate at the Corinda Los Trancos Canyon landfill is not being used for dust control. Buried waste in the landfill has the ability to absorb a high percentage of the leachate if replaced into the fill. This is a common and practical method to reduce the amount of leachate production.

17-10. The development of any landfill is required to comply with CAC Title 23, Chapter 3, Subchapter 15 requirements for protection of water resources. The California RWQCB is charged with the duty to ensure

compliance with regulations for protection of water resources. Included in these requirements is development of a contingency plan for protection and replacement of beneficial uses of downstream waters.

San Mateo County has supported development of the Apanolio Canyon portion of Ox Mountain based on landfill siting studies. The ongoing development of San Mateo County and changes in landfill siting regulations have narrowed the spectrum of possible alternative landfill site locations.

17-11. Water quality and quantity assurances have been developed for the Apanolio Canyon project. Provisions have been made for development of storage ponds and wells to be used for augmentation of stream flow in Apanolio Creek. Appendix D contains a brief description of this plan as developed by Purcell, Rhoades & Associates. The Draft Contingency Remedial Action Plan (dated August 15, 1988) provides measures to be taken in the unlikely event that contamination of water resources occurred (see Appendix D). Also see response to comment 5-7.

17-12. The application to construct an incinerator project at Redwood City has been withdrawn. Reasons for its withdrawal and potential for similar projects is discussed in Section 3.5e of the EIS.

Responses - Comment Letter 18

18- Comments noted.

Responses - Comment Letter 19

19-1. The County's approach to recycling has been and is expected to continue to be that of encouraging cities to voluntarily develop and implement recycling programs. The County has offered technical assistance to cities, in a program that has proven to be successful. Currently at least 12 cities are developing or have implemented recycling programs. Estimates are that San Mateo County currently recycles approximately 22 percent of its solid waste stream. With expansion of existing programs, the near future goal is to achieve 35 percent diversion of solid wastes from the County's landfills. Unless requested by the cities, the County has no authority to enforce a mandatory county-wide program. An expanded discussion of recycling programs is presented in Section 3.5e. In addition, collection companies, including BFI, have been actively participating in the County's recycling program.

19-2. The strict monitoring and inspection maintenance programs required for the project would give advance notice of any failure of the leachate containment facilities years before any leachate would flow through the bedrock into the lower canyon aquifer. Visual inspection and quarterly water sampling would identify any presence of leachate in surface waters prior to release into Apanolio Creek.

To provide a course of action should any contamination occur, a contingency remedial action plan has been developed for the project (Appendix D). BFI has proposed to furnish a corporate guarantee to cover the costs of implementation of corrective action programs approved by the LEA and other involved government agencies.

19-3. Leachate generated at the landfill would not be used for dust control. For a discussion of leachate handling and treatment options see Appendix D. For the expected volumes of leachate, on-site treatment would be considered a technically viable alternative. Also see response to comment 5-42. For discussion regarding SAM capacity and sludge disposal see the response to comment 17-8.

19-4. BFI is committed to implementing and/or pursuing the feasibility of the mitigation measures suggested in the EIS. Four mitigations are suggested and will be addressed by BFI as follows:

Mitigation 1 - The planned improvements to Highway 92 (i.e., widening to provide slow traffic lanes) by Caltrans will accommodate the need for passing lanes near Skyline Boulevard. No further action by BFI is required.

Mitigation 2 - BFI has improved the signs marking the access road to the Ox Mountain Sanitary Landfill. BFI also will discuss the need for any additional warning signs with Caltrans, and will provide improved signage as necessary.

Mitigation 3 - The traffic restrictions placed upon the truck access to the Ox Mountain Sanitary Landfill are currently being enforced by San Mateo County, and collection and transfer truck drivers are abiding by these restrictions. Access restriction will continue to be enforced.

Mitigation 4 - BFI will coordinate with Caltrans in a study of the feasibility of installing of a longer deceleration/right turn lane and an eastbound shadow/acceleration lane along Highway 92 at the landfill entrance road. BFI will widen the exit roadway from the landfill to facilitate separate right and left-turn exiting movements.

19-5. The field investigation technique is contained in the EIR for the Apanolio Canyon project, prepared by Thomas Reid Associates, 1984. The following is a summary of the field technique description.

Since any prehistoric or historic cultural resources would likely be confined to the relatively flat, easily accessible areas near the southern portion of the project site, only the primary and secondary terraces and stream bottom of Apanolio Creek were examined on foot. Trowels were commonly used to clear surface vegetation and duff to reveal surface soils. The reconnaissance procedures used corresponded to the "mixed strategy reconnaissance" described in "Recommended Procedures for Archaeological Impact Evaluation", published by the Society for California Archaeology. Characteristics indicating prehistoric or historic human activities are described in the EIS.

Responses - Comment Letter 20

20-1. The data presented in the DEIS was obtained from an ongoing study being conducted by Dr. Sam McGinnis, a recognized authority on the San Francisco garter snake. Since publication of the DEIS, the study conducted by McGinnis (study duration from May, 1987 to May, 1988) has been completed and is presented in Appendix B. This report contains a description of the trapping methodology and study results. See response to comment 5-6.

20-2. A report prepared by Dr. Samuel M. McGinnis and titled "A Spring Survey to Determine the Presence or Absence of the San Francisco Garter Snake (Thamnophis sirtalis tetrstaenia) in Two Tributaries of Pilarcitos Creek, Half Moon Bay," is included in Appendix B of the FEIS, and referenced in the discussion of the San Francisco Garter Snake at Section 4.3.4 Sensitive Species of the FEIS. The report and FEIS are subject to Federal, State, and local agency review, as well as public review, during the comment period of the FEIS. Dr. McGinnis' survey and subsequent report had not been completed at the time of release of the DEIS, May 1988; therefore, it was not available for inclusion in the DEIS.

20-3. See response to comment 8-2.

Responses - Comment Letter 21

21-1. The mitigation program is intended to compensate for the potential losses of beneficial uses. Stream flows and associated downstream uses by both man and wildlife would not be impacted by the project. Summer low flows would be maintained through flow augmentation at rates that are equal to or greater than existing flows. The dedication of a conservation easement in Corinda Los Trancos Creek would provide for permanent uses without losses.

21-2. The following response addresses the broad issues of protection of beneficial uses of the waters of the State and the project's Mitigation Plan. The majority of comments contained in the RWQCB's attachments were a result of review of the Administrative Draft EIS and preliminary drafts of the Mitigation Plan. Many of the comments contained in the Board's March 21, March 16, March 11, March 10, February 10, and January 20 letters and memos have been addressed. Therefore, discussion of additional information developed since publication of the DEIS is provided below.

Water Quantity and Quality

To mitigate reductions in surface and ground-water flows, streamflow augmentation in Apanolio Creek and recharge of the lower canyon aquifer would be provided. The same source of water for augmentation flows (i.e. ponds and wells) would be used for lower canyon aquifer recharge. A plan has been developed to install ground-water injection wells below the landfill to recharge the lower canyon aquifer (see Appendix D). Thus, no impact to existing beneficial uses of surface or ground water should occur. For further information of beneficial uses and lower canyon aquifer characteristics see PRA report, "Revised Hydrogeological Report and Beneficial Usage Analysis", dated March 20, 1988.

The turbidity that occurs in the creek consists primarily of fine (clay size) particles suspended mainly in storm runoff flows. This also occurs naturally and has little impact on the stream as the fine particles are suspended and carried downstream to the sea in high storm flows.

Reference materials that pertain to the comments regarding water resources have been developed by PRA and include: "Revised Hydrogeological Assessment and Water Resources Beneficial Usage Analysis", dated May 16, 1988; "Evaluation of Proposed Leachate Collection and Removal System (LCRS) and Leachate/Contaminated Ground-Water Treatment Systems", dated May 10, 1988 (Appendix D); and "Contingency Remedial Action Plan", PRA, dated August 15, 1988 (Appendix D).

Mitigation Plan

The Mitigation Plan for the proposed action has been revised based on comments received on the DEIS (see Appendix B). Plan components are summarized in EIS Section 5.3f.

Endangered Species

The trapping study being conducted to determine if the endangered San Francisco garter snake has been completed and is contained in Appendix B. This full year of trapping in the project area failed to capture any San Francisco garter snakes. Therefore, it can be concluded that the project site is not currently used by this species.

Responses - Comment Letter 22

22-1. The EIS evaluated all known sites that could potentially provide sanitary landfill capacity for San Mateo County. The most viable alternatives with potential to reduce the environmental impacts associated with the proposed Apanolio Canyon project were evaluated in greater detail. Additional discussion of potential alternatives and recycling is presented in EIS Sections 3.3 and 3.5e respectively.

The effect of planned resource recycling on the life-span of each of the alternatives evaluated in the EIS would be highly dependent upon the overall success of recycling efforts. Given the proposed goal to divert 35 percent of the County's waste stream, and the fact that records indicate 22 percent of the waste stream is currently diverted, the anticipated site life of each of the alternatives would be: Apanolio Canyon, 1,200-foot - 112 years; Apanolio Canyon, 850-foot - 30 years; Corinda Los Trancos Canyon - 19 years; and Nuff Canyon - 33 years.

Combinations of other alternatives do not necessarily provide a less damaging solution to San Mateo County's disposal needs. For example, the Apanolio Canyon project provides 93 years of capacity with impacts to 3.4 acres of wetland. A combination of the Corinda Los Trancos and Nuff Canyon alternatives would provide 43 years of capacity and would impact 2.63 acres of wetland. These alternatives may result in fewer impacts, but at the expense of capacity. In other words, these alternatives impact more habitat for a given unit of capacity than the more efficient Apanolio Canyon 1,200-foot alternative. Also see response to comment 22-9.

22-2. The Mitigation Plan has been revised and is intended to compensate for habitat losses in Apanolio Canyon. See response to comment 5-22. The habitat evaluation methodology has been approved by the California Department of Fish and Game (see response to comment 5-20).

22-3. 1) Potential impacts to downstream beneficial users would be mitigated through a streamflow augmentation program (see Appendix D) and the Contingency Remedial Action Plan (see Appendix D). These plans would mitigate any potential impacts to downgradient water quality or quantity that may result from landfill construction and operation.

2) The Contingency Remedial Action Plan is provided in Appendix D. This plan is presented in outline form, but provides detail for the types of actions that would be involved with remedial activities.

3) The U.S. Fish and Wildlife service is not required to respond to the study completed by the County, and to-date has not done so. The Service did address the potential presence of the snake in their letter dated September 16, 1987. In this letter, the Service provisionally excluded the snake from its list of endangered species that may occur on the project site based on negative findings of surveys as of that date.

22-4. The comments received on the Draft EIS have been addressed in this Final EIS. The Mitigation Plan for the project has been expanded and additional technical studies have been conducted. A review of this additional information may provide detail necessary to allow reclassification of the EIS.

22-5. Additional information has been incorporated into this FEIS based on comments received on the DEIS. The U.S. Army Corps of Engineers will review the information now available on the proposed action, and will make a decision on the Section 404 permit.

22-6. The alternatives analysis conducted for the EIS/Section 404 permit has evaluated all potential alternative landfill locations identified to-date. Through the various reviews of the alternatives studies contributing to the evaluation contained in the EIS, no additional potential alternative sites have been identified. The information presented on the most likely alternative sites has been expanded (see Section 3.3). The sites appearing to be the most feasible, while potentially reducing environmental impacts (i.e., Corinda Los Trancos and Nuff Canyons) have been carried through the EIS as alternatives. From the environmental analysis, it is apparent that the Corinda Los Trancos and Nuff Canyon alternatives could have a lesser impact on several resources. However, if cost, total capacity, and efficiency of the sites are considered, then the difference in these sites becomes less. For example, the quantity of wetland eliminated by these alternatives relative to the capacity of the site makes them, on a unit comparison basis, more damaging than the more efficient Apanolio Canyon 1,200-foot alternative. The objective of the EIS is to incorporate other project and alternative evaluations that address impacts other than physical impact to the natural environment. Determination of the least damaging impacts then could be viewed as a combination of project characteristics, socioeconomic, and physical environmental impacts.

Water quality protection would be assured through landfill design and requirements for water quality monitoring defined by the RWQCB. A contingency remedial action plan outlines corrective actions should a failure of the landfills containment system occur, and water contamination began to occur. With regard to downstream water quantity, a stream flow augmentation program has been developed (see Appendix D). This plan provides for maintenance of existing stream flows at the BFI property boundary.

Details of the Contingency Remedial Action Plan are provided in Appendix D.

The Mitigation Plan contained in the Draft EIS has been modified to accommodate comments received through the EIS review process and various agencies. This revised plan is intended to compensate for losses of fishery, wetland, riparian and upland resources in Apanolio Canyon. This plan is contained in Appendix B.

22-7. The 25-year criteria is not based on any adopted guidelines or established policy of solid waste planning. California law requires that the County of San Mateo develop a solid waste management plan sufficient to accommodate the disposal of solid wastes for a minimum of 20 years. The 25-year criteria is proposed as a way to evaluate alternatives and select one which would minimize environmental impacts over a longer term than sites whose life was shorter. From the County planning standpoint, an alternative which impacted 3 acres of sensitive habitat over a long period (large capacity site) appears preferable to one which impacts 3 acres over a short period of time (smaller capacity site). In this type of example, siting more than one smaller capacity facility would likely affect a greater quantity of sensitive habitat to achieve the same capacity as a larger capacity site. Thus, the incremental impacts appear inherently less in a facility with a long life-span. For this reason, the closing of landfills along the bayfront and the siting of larger, regional facilities away from urban areas makes prudent public policy.

Using 25 years as a siting criteria helps accomplish the goal of minimizing environmental impacts. Additionally, the permitting process for a landfill can be 5 years long, and in today's regulatory environment is becoming increasingly difficult. Large urban areas need large regional landfills. The County needs a landfill with a capacity of sufficient volume to provide assurance that another solid waste management disposal crisis will not occur soon. For example, Kirby Canyon and Altamont, owned and/or operated by Waste Management, Inc., have life expectancies beyond 25 years and the City and County of San Francisco contracted with Altamont for a 20-year period. The solid waste management plans for each Bay Area County contain policy language which encourages long-term landfill capacity. To avoid the siting of numerous landfills, the County believes one long-term landfill is a prudent, environmentally sensitive approach to necessary public concern.

As presented in Table 3.4-1 of the EIS, all sites not occurring on baylands have capacities of 6 years or less. Rejection of sites identified by the County of San Mateo Department of Public Works (Tables 3.3-2 and 3.3-3) were for reasons other than site life-span.

22-8. Addition of fish and wildlife criteria to the selection/screening process would probably not result in inclusion of additional potential alternative sites. The rejection of sites as non-viable is based on a "fatal-flaw" analysis, with each of the sites being rejected having one or more very limiting factors. For example, the primary reason for rejection of Locks and Frenchman's canyons is access (requiring use of Half Moon Bay city streets). This flaw exists at both sites regardless of consideration of additional criteria (i.e., fish and wildlife resources) which indeed potentially exist at both of these sites. It should be noted that fishery and wildlife habitat characteristics were included in the evaluation of Locks, Frenchman's, and Arroyo Leon Canyons. These sites were considered to be among the most feasible of the total array of alternatives identified.

22-9. Through the alternative site evaluations conducted to-date and through public review of these analyses, no additional potential sites have been identified for disposal of San Mateo County's solid wastes. The EIS presents information on alternatives to the best of our understanding as of this point in time. To combine alternatives with potential future actions (i.e., out-of-county after completion of the Forefill Alternative) would be speculative and would not be based upon an understanding of what actions will occur in Bay Area solid waste management in future years. (For example, truck traffic associated with long-distance hauling of refuse to more distant facilities in the future may at that time be very significant.) As indicated in response to comment 22-6, obtaining long-term capacity by permitting more numerous but smaller sites would not necessarily reduce impact to the environment. The information presented on the most likely alternative sites has been expanded (see Section 3.3).

A combination of alternative sites evaluated by the EIS could potentially provide increased capacity for San Mateo County solid wastes. However, the impacts associated with these alternatives would be cumulative, and may not represent an alternative to the proposed Apanolio Canyon project that would reduce environmental impacts. Several parameters could be used for comparison of alternative site combinations with the proposed project. These parameters may include:

- Site Capacity
- Life-span
- Efficiency
- Impact to biotic community (i.e., wetlands, fisheries)
- Cost

Using several of these categories for comparison, a table can be used to quickly assess the merits or demerits of any alternative.

<u>Alternative</u>	<u>Area (acres)</u>	<u>Capacity</u>	<u>Life-span (years)</u>	<u>Efficiency¹</u>	<u>Wetland (acres)</u>	<u>Fishery (feet)</u>
Apanolio (1,200')	285	123 mcy	93	265	3.43	RT(4,469)
Apanolio (850')	128	27 mcy	25	—	2.7	RT(4,469)
Corinda	78	17 mcy	16	144	0.89	RT(3,400)
Nuff	117	30 mcy	27	168	1.74	-----
CLT/Nuff	195	47 mcy	40	158	2.63	RT(3,400)

¹ Thousands of in-place tons per acre
RT - resident rainbow trout
mcy - million cubic yards

As illustrated by this simplified table, the combination of the Nuff Canyon and Corinda Los Trancos Canyon alternatives could reduce impact to biotic resources. However, this combination provides only 40 years of capacity, after which time San Mateo County would require additional capacity (i.e., development of another site). In addition, the cost of this combined alternative would be \$177.4 million, compared to an estimated \$129.4 million for the proposed action. This cost comparison does not include the loss of mineral resource availability or costs associated with land acquisition or quarry relocation.

With regard to resource recycling, Section 3.5e of the EIS has been expanded to provide additional information on San Mateo County's recycling efforts. Currently the County recycles approximately 22 percent of the solid waste stream that previously would be disposed of by landfilling. Plans are to increase the recycling effort to 35 percent diversion from the County's landfills. The estimates used in the DEIS accounted for the existing diversion of 22 percent of the materials, in that they were estimates of actual amounts of materials being landfilled. Thus, the difference between this current diversion and the County's goal would represent the foreseeable reduction in solid wastes. Provided the County's goal of 35 percent diversion was reached in the near future, the life-span of each of the alternatives could be as follows: Apanolio Canyon, 1,200-foot - 112 years; Apanolio Canyon, 850-foot - 30 years; Corinda Los Trancos Canyon - 19 years; and Nuff Canyon - 33 years.

22-10. The conflict with precluding use of the canyon for quarry purposes vs. landfill development is primarily land use and economic. Development scenarios for Nuff Canyon are presented in Section 3.3 of the EIS. This discussion indicates that, with sacrifice of mineral resource accessibility, a landfill in northern Nuff Canyon could operated in conjunction with the quarry activities. However, the rate of extraction of quarry materials is not sufficient to allow a simultaneous operation of the quarry and landfill (i.e., with quarry excavations providing capacity for landfill operations).

Expansion of the landfill into the quarry would preclude quarry operations at an estimated 27 years from initial development in Nuff Canyon. This would eliminate 43 years of mineral extraction operations. It should be noted that Nuff Canyon has been identified as the location for the County's solid waste disposal site upon completion of landfill activities in Apanolio Canyon and quarry activities in Nuff Canyon.

Nuff Canyon is currently under private ownership and its owner's have indicated that the property is not for sale. The canyon has been and is planned to continue to be leased for mineral extraction activities. Controlling owners are Gloria Babuin and Laura R. Devincenzi. The County would not be in a position to assist in acquisition of the site since its own policies provide for protection of mineral extraction activities.

22-11. Discussion of fish and wildlife criteria is provided in response 22-8. Regarding development of mitigation for each alternative refer to response 22-17.

22-12. Additional information regarding out-of-county viability is presented in EIS Section 3.3.

22-13. The preferred alternative would impact higher value habitat with regard to wetland and riparian habitats compared to the two alternative locations. However, development of a landfill in either of the alternative sites would impact valuable wetland and riparian areas. A recent study indicates that the fishery in Apanolio Creek, above the Bongard diversions, is resident trout (see response to comment 5-22). In addition, other factors, such as site capacity and efficiency should be considered as discussed in response to comment 22-9.

22-14. The downstream structures in Apanolio Creek appear to be effective barriers to steelhead migration. A study of existing fishery and hydrologic data was conducted by Mr. Tom Payne and concluded that the fishery above the diversions should be considered resident trout. This study is presented in Appendix B and is summarized in response to comment 5-22. Previous attempts by BFI to gain approval to modify these structures as outlined in the Mitigation Plan presented in the DEIS have failed.

To mitigate losses of fishery habitat in Apanolio Creek, the Mitigation Plan for the project proposes, in addition to other measures, enhancement of Corinda Los Trancos Creek to provide fishery habitat. Thus no net loss of existing fishery value would occur from the project.

22-15. Although riffle habitat is common in Apanolio Creek, pool habitat is not. The flows measured in the Nuff, Corinda Los Trancos and Apanolio Creeks are presented in response to comment 16-5. The proposed project would eliminate only the northern portion of Apanolio Creek and mitigation measures to protect summer low flows and water quality should ensure protection of downstream fishery values.

22-16. See responses to comments 22-24, 22-25, 22-26.

22-17. Mitigation requirements for each alternative would be determined by the magnitude of each habitat type (e.g., wetland, fishery) impacted. Development of comparable mitigation packages for each alternative could be quickly estimated by assuming that similar mitigation areas would be identified, and overall mitigation effort would be proportional to the difference in habitat impacts between the 1,200-foot Apanolio Canyon alternative and each of the other alternatives. Based upon this assumption, the cost of mitigation could be determined using a unit cost approach with mitigation costs for Apanolio Canyon as a guide.

Development of mitigation for potential out-of-county alternative impacts would be considered upon application to the receiving agency for import of waste. At that time, impacts would be identified, their magnitude evaluated and appropriate mitigation developed. The assessment of out-of-county disposal site impacts would be dependent upon the status of other applications before the lead agency for import of waste.

22-18. See responses to comments 5-19 and 5-21.

22-19. The vegetation surrounding the proposed sedimentation basins would develop a wetland habitat and would be maintained as a part of the mitigation to compensate for the areas the project would displace. The modified maintenance and management program for the facility would provide for permanent maintenance of this area. The greater than 1:1 replacement is intended to compensate for inability to mitigate in-kind.

22-20. The portion of Arroyo Leon Creek identified for mitigation is not dewatered each summer. The area proposed is above the agricultural diversion dams. Above the dams, Arroyo Leon is a perennial stream.

22-21. The Mitigation Plan is intended to replace the instream fisheries habitat lost in Apanolio Creek. There would be no net loss of habitat. See responses to comments 5-7 and 5-22.

22-22. Plans for augmentation of low summer flows in Apanolio Creek and protection of water quality have been developed. The augmentation plan, based on calculations derived from precipitation and natural runoff characteristics, guarantees that there would be no reduction in summer stream flow as compared to the present natural condition. This stream flow augmentation is briefly discussed in Appendix D. A draft contingency remedial action plan also has been developed and is presented in Appendix D.

22-23. The conservation easement in Corinda Los Trancos Creek would provide protection in perpetuity for the water development ponds, fish enhancement, bank stabilization plantings, and riparian development within the creek and around the ponds. All other mitigation values would be maintained for 5 years.

22-24. By the provision of augmentation flows, downstream water quantity would not be diminished by the project. Thus, there would be no anticipated adverse affect on the downstream fishery habitat due to flow regime changes.

22-25. The design of the landfill utilizes "state-of-the-art" proven technology, and is designed to be 100 percent effective in containment of landfill gases and leachate. In the unlikely event of failure, a Contingency Remedial Action Plan has been developed by the operator. This plan is outlined in Appendix D.

22-26. A copy of the "Draft Contingency Remedial Action Plan" is contained in Appendix D.

22-27. The following application process must be followed to obtain State RWQCB 401 Certification. The applicant must:

- 1) Complete a Report of Waste Discharge,
- 2) Provide a full description of the activity planned,
- 3) Submit one copy of all completed federal application forms for the activity planned,
- 4) Submit one copy of each final environmental document prepared for the planned activity,
- 5) Provide a filing fee of \$5,000,
- 6) Complete and submit an application for any exemptions to requirements of Subchapter 15 pursuant to Section 2510(b) of Subchapter 15, and
- 7) Submit an application, and the appropriate filing fee for an NPDES permit for filling wetlands.

Water quality certification can be made when a complete application is received and concerns of other agencies such as the California Department of Fish and Game are resolved to the satisfaction of the RWQCB.

22-28. The life-span calculations for the Apanolio Canyon expansion site are based on the current rate of filling at Corinda Los Trancos Canyon Landfill plus growth rate and do not include plans for importation of other counties' solid wastes.

22-29. A discussion of the existing and planned waste reduction programs in effect in San Mateo County is presented in Section 3.5e.

22-30. Based on review of existing plans for implementation of further waste reduction programs in San Mateo County, the total anticipated diversion from the receiving landfill would be approximately 35 percent. Additional detail on this reduction is provided in Section 3.5e.

22-31. Consideration of waste reduction through recycling efforts as presented in Section 3.5e, would extend the life-span of each of the alternatives evaluated. See response to comment 22-9 for landfill alternative life-spans.

Recycling and waste reduction would extend the life-span of all of the alternative sites and would not affect the unit cost of disposal. Recycling effects would not impact cost of landfill construction. Construction costs were determined using estimates of each landfill component. In addition, recycling would not affect the physical capacity of the site, but instead would reduce the rate of filling of the landfill. The unit cost (e.g., cost per cubic yard of refuse disposed) would remain as presented in the EIS. The difference would be apparent in estimated annual cost which is dependent upon the volume of solid waste disposed. Therefore, the effect on costs resulting from recycling efforts would be similar for all alternatives.

22-32. The report prepared for the County of San Mateo by Sam McGinnis (see response to comment 5-6) confirms that the San Francisco garter snake does not exist in the area of the proposed project. See response to comment 22-3.

Responses - Comment Letter 23

23-1. The Contingency Remedial Action Plan (PRA, August 15, 1988) (Appendix D) calls for complete replacement of water supplies for downstream users in the event that engineered systems should fail.

23-2. Development of a landfill in Nuff Canyon would interfere with and preclude access to the identified mineral resource in the canyon. San Mateo County views the two operations as incompatible from a land use perspective. Such a development would eliminate the use of a significant regional mineral resource which facilitates existing and planned development for homes, businesses and roadways. In addition, significant traffic and public safety impacts could result from a joint operation. The operation of two land uses heavily reliant on large trucks, on the same access roads, would create safety impacts and would be inconsistent with the Mineral Policies of the General Plan for San Mateo County.

The Nuff Canyon site provides an estimated 70 years of mineral resource availability to San Mateo County. In general, commercial mineral resources are in short supply. There are only two large regional quarries in the County; Nuff Canyon, producing approximately 400,000 tons of rock fill per year, is one of these sites. Future development of quarries is not anticipated since they are dependent upon applications from commercial operators who can foresee a productive use for the resource and have the capital to create profitable businesses. Public opposition has grown to siting new facilities and the last application was denied by the Planning Commission in 1983 because of community opposition to the proposal.

23-3. The California Division of Mines and Geology (CDMG) identifies the quarry operation at Nuff Canyon as a significant regional resource. The County of San Mateo also recognizes the importance of this resource and its general plan policies provide protection of significant quarry operations. However, CDMG, nor the County have identified mineral resources in either Apanolio Canyon or Corinda Los Trancos Canyon. Since these canyons are designated as the County's preferred location for sanitary landfill development, use as a quarry would be inconsistent with existing plans. Therefore, since a mineral resource has been developed in Nuff Canyon that is projected to continue into the year 2050, and since impacts associated with landfills and quarry operations are in many ways similar, it seems unnecessary to investigate the proposed landfill alternative sites for potential mineral resources.

23-4. The level of detail regarding wildlife habitat for the alternative sites presented in the EIS is intended to provide information adequate to identify potential impacts associated with project development and to compare alternative sites. To further define the quantity of habitat that may be defined as wetland, additional studies were conducted in Corinda Los

Trancos and Nuff canyons. The additional wetland information is contained in the Biology section of the EIS. In addition, a study was conducted by Mr. Tom Payne to evaluate existing data generated by agency and BFI studies of the fishery resource in Apanolio Canyon. This study is contained in Appendix B.

The Mitigation Plan is intended to provide adequate mitigation measures to offset the riparian wetland habitat and perennial stream losses. See responses to comments 5-7 and 5-21.

23-5. The study conducted by Dr. Sam McGinnis did not document the presence of any San Francisco garter snakes in the study area (see Appendix B). An independent study by FWS documented the presence of a San Francisco garter snake at the mouth of Pilarcitos Creek, which is approximately 4 miles from the project site.

23-6. An update of the October 1987 report "Review of Available Scientific Information on Six Candidate Insects" by Dr. Arnold was prepared (see Appendix B). In this update, additional information is presented on the San Francisco fork-tailed damselfly, Leech's skyline diving beetle, and Ricksecker's water scavenger beetle.

The San Francisco fork-tailed damselfly appears to prefer creeks, seepages, or flood-control drainages with open calm pools or ponds. Thus, conditions at the Apanolio Canyon site would not provide the desired habitat. In addition, all of the known occurrences of the damselfly in San Mateo County are east of the Coast Range.

Recent identifications have greatly increased the range of the Leech's skyline diving beetle. This species is now expected to occur in several California counties, as well as Colorado, Oregon, and Washington. Although no decision has been made by USFWS, it is likely that the candidate status of this species will be downgraded.

Records indicate that this Ricksecker's water scavenger beetle is associated with pond or vernal pool habitats, although recent attempts to obtain specimens have been unsuccessful. Although it seems unlikely that the habitat within the project area of Apanolio Canyon would be suitable, it may occur in nearby ponds. A survey of these ponds would be necessary to determine the status of these habitats.

23-7. A review of the sensitive species potentially occurring in the Apanolio Canyon area was prepared by Charles A. Patterson and is presented in Appendix B. Mr. Patterson has conducted a more thorough site visit to more clearly describe the habitat types occurring in the proposed project area within Apanolio Canyon. His findings are presented in a second report (see Appendix B) which concludes that there is little probability that the project area habitats would support any of the sensitive species in question.

23-8. The disposal site for materials from the sedimentation basin would be at the landfill. The Geotechnical Engineer would determine the suitability of the material for possible use as cover. The sediment quantity would be expected to be insignificant compared to the volume of waste placed in the landfill.

23-9. The 4:1 refuse to cover ratio should be interpreted as follows:

4 part refuse: 1 part cover. For 1 million cubic yards (cy) of total fill, 4 parts, or 800,000 cy would be waste and 1 part or 200,000 cy would be fill. The sentence should read, "Assuming a 4:1 refuse-to-cover ratio, the anticipated annual placement of one million cubic yards of fill would require 200,000 cubic yards of cover material per year".

23-10. A standard roughness for concrete pipe of Manning's $n=0.013$ was used. In sections where more roughness was desirable, Manning's $n=0.016$ was used for "broom finish" concrete, a value recommended by manufacturers of this pipe.

23-11. The perimeter ditches are surface structures and thus could be easily repaired. Damage to the perimeter ditches may occur due to erosion from gravel or rocks, or due to foundation movement. There are no velocity restrictions in the perimeter ditch system and velocities as high as 58 feet per second could occur in some areas.

Flip bucket energy dissipators would be used for the perimeter ditches on Area 2 of the proposed landfill. These dissipators are effective for velocities in excess of 50 feet per second. Impact type dissipators are effective for flow velocities of up to about 50 feet per second. The energy dissipator dimensions for impact type dissipators are calculated based on the incoming flow discharge and velocities.

23-12. The flow velocities in the underdrain were calculated using Manning's formula for free surface flow.

The maximum flow velocities in the underdrain are limited to 40 feet per second in concrete conduits and to 45 feet per second in concrete encased corrugated steel conduits. Excess wear in the underdrain would be prevented by ponds and screens which prevent rocks and gravel from entering the underdrains, and by the flow velocity limits. Limiting flow velocities would prevent cavitation damage to the underdrain.

23-13. The underdrain conduit would be a trench installation founded on bedrock or soil-cement. The conduit would be extremely flexible relative to the surrounding and underlying fresh bedrock or soil-cement. During an earthquake the ground would be distorted by traveling seismic waves. The

conduit, being flexible, would essentially follow the displacements and deformations of these passing waves. The surface waves produce curvature or bending stresses and the Rayleigh and Love waves induce longitudinal compressions and tension stresses. An evaluation of a maximum probable earthquake on the nearby San Andreas Fault provides the magnitude of these seismic induced stresses.

The final design requires a heavily reinforced concrete encasement to be installed around the concrete underdrain conduit. The dimensions, reinforcing and strength of this structure is analyzed to resist the forces imposed upon it. These forces include the overburden pressure from the landfill, differential settlement, temperature, shrinkage and effects from the maximum probable earthquake. It is proposed to monitor the subdrain system for strain and to subject the system to an annual T.V. inspection with supplemental inspections after seismic events of 5.0 or greater on the Richter scale.

23-14. In the case of failure of the subdrain system, it would be feasible to reroute surface water around the landfill in 'V' ditches and penstocks. The benefits of the current design are its structural integrity (founded on/in competent bedrock) and its dual role for surface-water conveyance from above the landfill and ground-water collection from underneath the landfill. For details regarding contingency actions should a failure of the subdrain system occur, see the "Draft Contingency Remedial Action Plan" contained in Appendix D.

23-15. In the event of failure of the ground-water collection system, the pipes could be repaired by the emplacement of internal pipe sleeves or other standard methods of repairing underground pipes. Surface water could be diverted around the landfill and any contaminated water could be treated on site. These corrective actions and others are outlined in the "Draft Contingency Remedial Action Plan", developed by Purcell, Rhoades & Associates, (Appendix D).

Augmentation of stream flows in Apanolio Creek, while repairs are made, would be provided by water pumped from ponds and wells.

23-16. The sedimentation basin designed for the Apanolio Canyon Expansion Site would be expected to reduce the sediment load in Apanolio Creek to below natural occurrence levels.

23-17. The existing Corinda Los Trancos landfill is an example of a landfill in a similar geological setting. The containment systems there are performing as designed.

23-18. To respond to this comment the nature of the Philip Williams and Associates report referenced should be clarified. The hydrologic evaluation prepared was not based on any on-site field data. Flows were estimated

using gauge data from Pilarcitos Creek at Half Moon Bay and applying appropriate assumptions. Flood flows (1986) of 225 cfs were estimated for Apanolio Creek. The conclusion of the study was as follows:

"To estimate a fairly precise flow depth for a discharge of 225 cfs would require several surveyed cross section of the creek and a local channel gradients through the diversion structure. For "ball park" estimate purposes, one could assume a flow velocity of 6 or 7 feet per second, which would require 29 to 32 square feet of cross sectional flow area. A flow depth of 3 to 5 feet over the dam may be a reasonable estimate based on the limited information I have."

To further the investigation of the flow characteristics of this potential diversion, Hydrocomp, Inc. conducted a field investigation to collect specific data on the structures characteristics. Using this data and projected flood flows of 150 and 300 cfs, Hydrocomp estimated the flow velocities and depths that would occur. Based on this detailed evaluation (see Appendix B), Mr. Tom Payne estimates that passage of this structure by migrating steelhead is highly unlikely (see Appendix B).

23-19. Any detection of contamination of the ground water beneath or down-gradient from the proposed landfill would trigger remedial actions as outlined in the contingency plan for the facility. Before contaminated ground water could migrate off-site, contingency measures would be enacted to contain contaminants.

The mitigation for the proposed project also allows for augmentation of stream flows in Apanolio Creek during critical summer low flows. This, combined with protection of water quality via the contingency plan, would prevent significant downstream impacts to beneficial uses of ground and surface waters. In addition, the trapping effort to identify the presence of the San Francisco garter snake failed to capture the snake in over 13,500 trap days. A previous survey of the project area and downstream areas by snake experts failed to identify suitable habitat for the endangered species.

23-20. Estimates of the riparian and wetland habitat in Apanolio Canyon have been determined using various methodologies. Thomas Reid Associates (1984), using aerial photographs of the site, determined that 8 acres of riparian vegetation would be impacted by the proposed 1,200-foot Apanolio Canyon project. The determination of approximately 11 acres resulted from a U.S. Army Corps of Engineers estimate that also was derived from aerial photograph analysis. Alder canopy was used to estimate the extent of wetland resources.

Subsequent to these determinations, detailed on-site field investigations were conducted in the canyon to more accurately determine the area that would be defined as "waters of the United States and adjacent

wetlands." These studies, conducted by HLA and the Corps, characterized 3.26 and 3.34 acres, respectively, within the project area as potential wetland subject to Corps jurisdiction.

Final mapping by the Corps included an additional jurisdictional area along small streams observed on air photos. The resulting final jurisdiction was 3.43 acres. For the purposes of assessing potential impacts from the proposed action, the 11-acre value was used for riparian habitat, of which 3.43 acres is wetland subject to Corps jurisdiction.

23-21. The destruction of fishery habitat at the site would occur in the first years of construction. The fishery mitigation plan is scheduled for immediate implementation and possibly before any destruction of habitat occurs at the project site. Riparian habitat at the site would also be destroyed in the first years of construction; however, upstream riparian areas would be eliminated more slowly as the landfill progressed upward. As with the fishery mitigation, compensation for loss of riparian habitat would be installed prior to or concurrently with habitat elimination at the site.

23-22. The EIS stands corrected, a portion of the sedentary animals within Apanolio Canyon would be destroyed during landfill activities; however, as stated in the EIS, it would not be anticipated that these impacts would effect overall populations of affected species.

The EIS states that a reduction in local populations of displaced mobile wildlife species would likely occur. The habitat created through implementation of the proposed mitigation plan would provide replacement habitat for displaced species; however, local populations could fluctuate due to changes in habitat distribution.

23-23. Based on scientific evaluation, Apanolio Creek has been determined to support a resident rainbow trout fishery. Data generated to-date does not support the claim that steelhead exist (see Tom Payne report - Appendix B). The stream does have historic and potential value as a steelhead stream. See response to comment 5-22.

23-24. Water Sampling and Self Monitoring Programs are under the purview of the RWQCB and Subchapter 15 regulations. The regulations also specify a 30-year post-closure monitoring and maintenance period. The proposed landfill would comply with all requirements stipulated by the RWQCB. For discussion of corrective actions, see the "Draft Contingency Remedial Action Plan" contained in Appendix D.

23-25. The actual stream course on BFI's property from the southern boundary to the natural rock fall is 5,289 feet. Approximately the lower 640 feet of this segment would not be modified by landfill development. The remaining 4,649 feet which support a resident rainbow trout population, would be impacted. See response to comment 16-8.

23-26. The proposed widening of Highway 92 is not directly related to the proposed expansion of the Ox Mountain Sanitary Landfill. This project has been planned because of traffic congestion generated along this route. The traffic analysis in the EIS acknowledges the contribution of landfill truck traffic to congestion problems on Highway 92. The biological impacts (i.e., environmental impacts) associated with the widening project should be evaluated for that project (i.e., Caltrans compliance with CEQA).

23-27. The alternatives analysis for the project attempted to provide an avoidance of sensitive wildlife habitat. For example, bayside landfills were excluded from consideration because of their wetland habitat characteristics and applicable regulations. To identify a site that would meet the purpose and need for the proposed action, while avoiding all biological impacts, has been futile. Therefore, the identification of the proposed site in itself is an attempt to reduce these types of impacts. In addition, the mitigation plan developed for the project is intended to compensate for biological impacts that could not be avoided through landfill siting studies.

23-28. The streambank revegetation projects along Pilarcitos Creek have been modified from those presented in the Draft EIS (see Appendix B). The current plan identifies a 480-foot creek section on the Sare property and a 1,180-foot section of creek on the V. J. Cozzolino property. These areas do not contain creek segments currently subject to court action. Therefore, the previously proposed 3,000 feet of streambank revegetation has been reduced to 1,600 feet.

23-29. The selection of species for riparian planting has been guided by the need to quickly generate high value habitat. The species chosen are fast growing and would quickly generate high value habitat. The Mitigation Plan has been revised to indicate that the time required to fully establish riparian habitat would be 10 years (see Mitigation Plan tables in the Plan's Appendix B).

Surveys of the alders currently occupying Apanolio Canyon (i.e., ring counts) indicate most are about 40 years in age.

23-30. A Streambed Alteration Agreement does exist between Caltrans and CDFG for modification of this barrier; however, correction of this structure has yet to occur. BFI has proposed, and has reached an agreement with Caltrans, to correct this low flow migration barrier. See response to comment 16-9.

23-31. The habitat value comparison table for Upper Pilarcitos Creek has been revised. This comparison, now presented in the Mitigation Plan's Table B-10, indicates the future habitat value gain is limited to upstream access.

23-32. The correct name for resident rainbow trout is Salmo gairdneri. Any references in the DEIS to Salmo gairdneri gairdneri as resident rainbow trout were incorrect.

23-33. Based on the data reported by Hydrocomp and stream characteristics, it is nearly impossible for steelhead to pass the barriers on Apanolio Creek. The data provided by Phil Williams Associates was not supported by specific field data (see response to comment 23-18). See response to comment 5-22 and the Tom Payne report contained in Appendix B for information on steelhead potential to navigate this obstacle.

23-34. See response to comment 5-22. The studies to define the biotic resources within Apanolio Canyon have extended over several years (i.e., from spring 1983 to fall 1988). During this period various vegetation, fishery, and related biological surveys were completed. Although some of these years may have had less precipitation than others, the biotic resources observed should be representative of the site. In addition, hydrologic evaluations have been based on site characteristics and rainfall records that incorporate years of data (i.e., both dry and heavy rainfall years). Although individual studies may have been conducted in periods of less than average precipitation, studies should accurately reflect the overall condition and type of habitat at the site.

23-35. The correct length of the fishery is 4,649 (see responses to comments 16-8 and 23-25).

23-36. Indeed, larger fish may leave the stream; however, some would probably remain. No larger fish were sampled during the electro fishing process. See the discussion of available data presented in the report prepared by Mr. Tom Payne (Appendix B).

23-37. The bottom substrate consists primarily of sands and silts that are continually moving. The sands and silts provide only marginal spawning habitat and food producing areas. Much of Apanolio Creek is devoid of any suitable rocks or boulders that would provide habitat for food species and cover for fisheries.

23-38. No data exist regarding a location of steelhead spawning habitat in upper Apanolio Creek. A recent study indicates that steelhead do not spawn in upper Apanolio Creek, including the project site (see response to comment 5-22). In addition, mitigation measures proposed to modify the downstream barriers in Apanolio Creek have been eliminated.

23-39. There would be no reduction in summer flows in Apanolio Creek since BFI has agreed to offset any reduction in these flows through implementation of a streamflow augmentation plan (see response to comment 5-7). Instream structures are proposed for the portion of Apanolio Creek on BFI property. These structures are intended to improve instream conditions for the existing fishery during low flow periods.

23-40. The flow characteristics and the watershed size in Apanolio Creek are very different from those in Corinda Los Trancos Creek. Mitigation measures and applicable regulatory frameworks for the two projects are also very different.

BFI would augment the flow of water within Apanolio Canyon to meet or exceed the no net loss criteria.

23-41. The habitat values for Apanolio Creek were reevaluated. A revised table of values is presented in the Mitigation Plan (Appendix B).

23-42. The evaluation system was objectively applied to many species. The species in question have been eliminated from the evaluation process for the existing environment. It should be noted that the creation of habitat through implementation of the proposed mitigations would generate valuable habitat for those species eliminated above. Therefore, these groupings were included in the evaluation of mitigation components.

23-43. A continuous planting of alder and willows would be established on the entire shoreline except at the maintenance access point. See the Mitigation Plan (Appendix B) for details on species to be planted. Although some marsh species would become established along these shorelines, the intent of the mitigation is to provide riparian habitat.

23-44. The riparian habitat development would establish very rapidly. Cleaning of the sediment basins would be conducted in a manner to minimize disturbance of vegetation surrounding the basin. In addition, the actual destruction of existing riparian habitat would be gradual, occurring over a fairly long period (up to 30 years for habitat located above areas of initial construction). Surveys of the alders currently occupying Apanolio Canyon indicate these trees are about 40 years old. Also see response to comment 23-29.

23-45. Field investigation indicates that most of the coastal chaparral on the Ox Mountain Ranch are tall, decadent and nearly impenetrable. The local deer population may already be benefiting from the edge effect created by operation of the Corinda Los Trancos Canyon landfill. The proposed burn program would develop a mixed mosaic of young, mid-aged, and older brush islands. See response to comment 6-8 regarding the proposed burns.

23-46. The burning cycle would be based on regrowth conditions and maturity of the brush. If found to be too frequent, the burning cycle would be extended accordingly. The root mass of the burned vegetation would be left undisturbed. This factor and the noncontiguous nature of burn areas would likely prevent significant increases in sedimentation.

23-47. A mosaic of young and old brush would remain on the BFI property. The feeding areas and predator-prey relationships may change locally; however, overall changes are not anticipated. The habitat successional stages created would provide a greater number and diversity of wildlife species.

23-48. Areas where Douglas fir would be established would not be burned until conditions ensure their survival.

23-49. For consistency, the Mitigation Plan presented in the Draft EIS evaluated all habitat criteria for both existing and post-mitigation conditions. Based on comments received, the species in question have been eliminated from the habitat value calculations for the existing conditions in Apanolio Canyon.

23-50. The development of the pond below Scarpers Peak would have high value and utilization early as the vegetation develops due to the local uniqueness of this type. This pond would provide a ridgetop water source within the chaparral and Douglas fir community. The time required for full habitat development would be 15 years. Also see response to comment 23-29.

23-51. See response to comment 5-19 and revised habitat evaluation table.

23-52. The ponds referred to in Corinda Los Trancos Canyon currently exist. Mitigation plantings would develop rapidly around these ponds.

23-53. These species have been dropped from the habitat evaluation for this mitigation component.

23-54. The mitigation plan does not include flows in terms of cubic feet or depth when describing low flows. The statement that during winter low flows a sand bar forms across the mouth of Pilarcitos Creek is correct. However, flow within Pilarcitos Creek are very cyclic and subject to winter storm events. Thus high flows are necessary to allow steelhead to gain access into the Creek. It is within the upper reaches of Pilarcitos that the low flow barrier corrections are proposed.

23-55. Steelhead do respond to freshwater flows such as the short high peak flows typical of Pilarcitos Creek and its tributaries following storm events. It is in the upper reaches of these watersheds that the winter low flows between these peak flows restrict upstream movement to migrating fish due to the presence of barriers. Correction of these winter low flow barriers would provide continuous winter access.

23-56. Local California Department of Fish and Game personnel have advised BFI that the low flow barriers on the Arroyo Leon and San Pedro Creeks do effectively prevent the migration of steelhead.

23-57. Conflicting information has been received from the CDFG regarding the 35-foot high flashboard dams on Arroyo Leon Creek. CDFG Supervisor Wooster has indicated that the dams do not interfere with steelhead migration. Therefore, providing improved passage at the low flow barrier above these dams is useful mitigation.

23-58. The aquatic habitat in Corinda Los Trancos Creek has not been enhanced due to the instability of the streambanks. Also, the sediment control system for the Corinda Los Trancos Canyon landfill is considerably different from the system proposed for the Apanolio Canyon project.

23-59. BFI is proposing to monitor the mitigation program for 5 years.

23-60. The fisheries monitoring program has been modified. See Mitigation Plan, Appendix B.

23-61. Several criteria would be used in monitoring plant success: growth, health, and vigor would be considered in addition to survival. Should growth and vigor not be of the quality that is needed, appropriate remedial action would be taken.

23-62. Review of existing data by Mr. Tom Payne (Appendix B) indicates that Apanolio Creek is not a steelhead stream within the proposed project area. See response to comment 5-22.

23-63. In response to comments received on the content of the Draft EIS, several studies have been completed which provide additional information on the biological communities at the proposed project site and alternative sites evaluated. These studies include detailed wetlands evaluations in Nuff and Corinda Los Trancos Canyons, review of all available fishery data (see Tom Payne report, Appendix B) and evaluation of fish migration barriers in Apanolio Creek, additional review of literature and site visits for the marbled murrelet, sensitive plant species, and insects. In addition, the Mitigation Plan for the project has been revised to provide further compensation for loss of resources in Apanolio Canyon. This additional information is presented in the EIS text and its appendices.

23-64. Comment noted.

23-65. The Corinda Los Trancos and Nuff Canyon alternatives would have a lesser impact to the biological resources compared to the Apanolio Canyon alternative. Also see response to comment 22-9.

23-66. The underdrain design considers the durability of the construction materials, and possible causes of excess wear. The design eliminates abrasion from gravel or rocks, and limits flow velocities to prevent cavitation. No other factors can be identified that would cause excess wear in the underdrain.

The design values for roughness in the underdrain are within the normal range of Manning's n values used for concrete pipe. Regular inspection of the underdrain would identify any areas that require maintenance.

Responses - Comment Letter 24

24-1. The EIS does evaluate alternatives to the proposed project that were determined to be the most viable alternatives, potentially reducing the environmental impacts resulting from the action, while maintaining the purpose of the proposed action. A commitment by the County to a particular site will be considered in the Corps decision on the project; however, this influence will comprise only a portion of the factors taken into consideration by the Corps.

24-2. The recycling programs within San Mateo County are discussed in Section 3.5e of the EIS. The effect of resource recycling on the various alternatives evaluated is discussed in responses to comments 22-9 and 22-31.

24-3. An expanded discussion of existing and proposed recycling programs is provided in EIS Section 3.5e.

24-4. See response to comments 5-7, 5-20 and 5-21.

24-5. No significant off-site impacts are anticipated from the proposed development of the northern portion of Apanolio Canyon. The facility would be located entirely on BFI property and a buffer between down canyon land uses and the landfill would be provided. The project's mitigation components including the streamflow augmentation program and the contingency plan developed for the project should prevent degradation or modification of downstream areas. Therefore, any potential economic or land use impacts that may be associated with streamflow reduction or water resource contamination could and would be corrected through mitigation and remedial actions.

24-6. A discussion of the leachate collection and containment system and potential on-site treatment alternatives is contained in the letter report contained in Appendix D. Also see response to comment 5-42.

24-7. Site life is directly dependent upon rate of filling. Waste reduction would increase site life of all the alternative sites proportionately when compared to the Apanolio Canyon Expansion Site. See responses to comments 22-9 and 22-31.

24-8. See response to comment 23-34.

24-9. The County currently encourages volunteer recycling programs. Through this process, the County and cities have reduced the waste stream being disposed by landfilling by 23 percent. Future programs have goals of achieving a 35 percent diversion. Mandatory recycling does not necessarily ensure that recycling goals mandated by these programs will be met. Recycling requires cooperation by the public, and more vigorous goals of 50

percent recovery in other communities have not been obtained (see discussion in Section 3.5e). Reduction in solid waste volume disposed of by landfilling would increase site life as discussed in responses to comments 22-9 and 22-31.

24-10. The alternatives for the project (i.e., Apanolio 1,200-foot, Apanolio 850-foot, and Corinda Los Trancos Forefill) would use the same landfill access road. This factor, combined with the relatively established solid waste production areas and network of transfer stations would generate very similar if not identical traffic conditions for each of the alternatives mentioned above. Given this fact, the only difference between these alternatives is the duration of the traffic flow to the landfill (e.g., 93 years of impact at the entrance intersection for the Apanolio Canyon 1,200-foot alternative vs. 16 years of impact for the Forefill alternative). Nuff Canyon, due to its close proximity, would be very similar to the other alternatives with respect to traffic; however, quarry traffic also would be present.

24-11. The statement that an EIR or possibly an EIS would be required for the Corinda Los Trancos Canyon or the Nuff Canyon alternatives does not refer to the sufficiency of the present draft EIS, but rather to the additional permitting requirements that would be required to secure permits for one of these sites. The permitting process required for Corinda Los Trancos Canyon or any other alternative site would require, at a minimum, an EIR and possibly an EIS.

The sufficiency of the draft EIS, which is focused on the Apanolio Canyon site, is measured by its treatment of this site. Although the draft EIS must discuss alternatives, the preparation of an analysis equivalent of an independent EIS for each alternative site is not required. Case law and the regulations promulgated by the Council on Environmental Quality (CEQ), read in conjunction with NEPA, require the discussion of reasonable alternatives to the preferred action, including the no-action alternative. The scope of the alternative discussion is to be broad enough so that information is sufficient to study, develop and describe the alternative. The touchstone of the alternative discussion is the "rule of reason." This applies both with respect to the number of alternatives that need be discussed and to the depth of discussion as to individual alternatives. The CEQ requirements provide that the EIS explore and objectively evaluate all reasonable alternatives. In this regard, it is to devote substantial treatment to each alternative in sufficient detail to permit reviewers to evaluate the comparative merits. This does not mean, however, that the equivalent of a separate EIS is to be prepared as to each alternative. On the other hand, the degree of analysis devoted to each alternative should be substantially similar to that provided with respect to the proposed action. The CEQ requirements have been fulfilled in this EIS which discusses in great detail every alternative, including the no-action alternative.

24-12. Closure of the landfills referenced was necessary for two primary reasons; 1) the sites reached their capacity, and 2) closure by order of the RWQCB. Because of the stringent water quality regulations that have been developed, the older facilities typically did not meet these water protection standards. A review of potential landfill locations within the County, presented in Table 3.4-1, illustrates the conflicts which would exist in development of a landfill at any of these sites.

24-13. The statement "The original landfill [Corinda Los Trancos] was approved with the expectation and understanding that expansion of the landfill into Apanolio Canyon would occur when the Corinda Los Trancos Canyon facility neared capacity" was the understanding of the applicant (BFI) and the County of San Mateo.

24-14. The use of "ultimately" refers to the fact that the wetland habitat at the site would be eliminated at a rate dependent upon the rate of canyon fill. Initially, a large portion of the wetland and riparian area would be eliminated, followed by a gradual destruction of habitat. Thus, until the landfill reached an elevation that coincided with the upper extent of wetland would the 3.43 acres be completely eliminated.

24-15. See response to comment 17-8.

24-16. The intent of this statement is not to avoid investigation of alternative sites within the County, but to restate the fact that no potentially viable alternative sites have been identified by siting studies. All smaller sites are constrained for the reasons explained in the alternative evaluation section of the EIS (Table 3.4-1)

24-17. See response to comments 5-19 and 5-21.

24-18. The burns would be scattered around the Ox Mountain Ranch so that no denuding would occur. These burned "islands" would maximize the edge effect. Roots of the species would remain intact to alleviate landsliding. For the benefits of the burn program, see responses to comments 6-8 and 25-2.

24-19. Using indigenous grasses is not as beneficial to wildlife as using an enhanced species mix. Many of the "native" species in the area are the result of over grazing and mismanagement. The species chosen would provide better habitat values than strictly native species.

24-20. The habitat evaluation values have been revised. See response to comment 5-19 concerning the habitat evaluation methodology; see response to comment 5-23 regarding the concrete channel shaded with ceanothus.

24-21. The Mitigation Plan refers to low flow periods as those during the winter, between storm events, when steelhead would be migrating. As a result, steelhead would be benefited by easier passage on the streams

proposed in the mitigation. The low flow barrier modifications proposed for Apanolio Creek have been dropped from the Plan because land owner permission was not obtained.

24-22. Property owner approvals to allow modifications on all streams currently proposed for mitigation are on file at BFI's office.

24-23. The Mitigation Plan is intended to provide for compensation of 3.43 acres of wetlands lost in Apanolio Canyon. See response to comments 5-7 and 5-22 for more detail about the revisions to the overall mitigation program.

24-24. BFI is proposing use of 285 acres of the 2,786 acres contained in the Ox Mountain Ranch. Land ownership includes surrounding ridge lines and portions of Locks and Frenchman's canyons. This ownership provides an adequate buffer zone from surrounding areas, and as surrounding properties become available BFI has been pursuing purchases of these properties. Future landfill development would require acquisition of permits (e.g., land use) at which time potential impacts to surrounding properties and aesthetics would be evaluated.

Responses - Comment Letter 25

25-1. Recognizing the complexity and diversity of plant communities and wildlife habitats within the project area, surveys of the biota have been conducted continuously since 1983.

March - June 1983, Thomas Reid Associates conducted surveys to document existing baseline biological conditions in the project area.

In 1983 and again in 1987, Dr. Ted Pappenfus searched the project area for the San Francisco Garter Snake.

September 1986, California Department of Fish and Game electroshocked in sections of Apanolio Creek to assess general fisheries and steelhead trout use.

September 1986 through March 1988, Ralph Osterling Consultants completed numerous surveys of terrestrial and aquatic habitats in Apanolio Canyon, Corinda Los Trancos and Nuff Canyon.

February 1987, Harding Lawson Associates conducted a week long intensive field survey of all the wetland and riparian habitats on the site.

May 1987, Dr. Samuel McGinnis began trapping on site for the San Francisco Garter Snake.

July 30, 1987, Point Reyes Bird Observatory personnel surveyed the habitat types and assessed the potential for the occurrence of the marbled murelet on the project site.

September 22, 1987, Dr. Richard Arnold, an entomologist, conducted a survey of the habitat types in the project area and prepared a report addressing the issues of sensitive insect species on the site.

September 29, 1987, HLA conducted surveys of the aquatic resources on the project site.

March through May 1988, Dr. Samuel McGinnis continued trapping program for the San Francisco Garter Snake.

25-2. To determine significance of impacts for the project alternatives, an objective comparison of potential habitat loss was employed. The complexity and diversity found in each habitat type identified for all project alternatives is discussed in section 4.3 of the EIS and is described in detail in the EIR prepared by Thomas Reid Associates (1984). Cumulative impacts resulting from construction and operation of the project are addressed in section 5.13 of the EIS.

25-3. The EIS identifies six major natural plant communities on the site: coastal scrub, riparian woodland, mixed evergreen forest, chaparral and grassland. These plant communities are consistent with those identified in the EIR prepared by Thomas Reid Associates. When quantifying the amount of each vegetation type that would be removed as a result of the project, coastal scrub and chaparral were combined because the "line" separating these habitats on the project site is not well defined. The major difference in the chaparral and coastal scrub habitats observed in Apanolio Canyon is the predominance of Ceanothus or Baccharis, respectively. Other species intergrade freely between the two habitat types and therefore species composition is similar.

25-4. A common approach to describing the existing vegetation types in a particular area is to 1) identify the types, 2) review aerial photographs to determine distribution of the types in the project area, 3) take representative transects through the types identified to characterize species composition and abundance. This method was employed by Thomas Reid Associates in describing the vegetation types for the EIR (1984) and that data was reviewed in preparing the EIS. The list of plant species commonly found in the area provided by Thomas Reid Associates was derived from three separate site visits in March, May and June, 1983.

25-5. See 25-1 and 25-4.

25-6. The plant life has been sufficiently addressed in the EIR and the EIS. No deliberate effort was made to avoid any topic or presentation. Nor has any effort been made to avoid mitigation of losses for removal of the plant community.

25-7. Studies on the effects of disturbance in northern coastal scrub vegetation are limited. However, Dr. Bob Martin with the Department of Forestry at the University of California is currently looking at fire management in this community type on campus and a graduate thesis on file with the Department of Biology at San Francisco State University, prepared by Marion Elliot reports on the effects of fire in the northern coastal scrub at Point Reyes. Additionally, the 1985 fire in the hills of Los Gatos affected many acres of northern coastal scrub habitat which according to local horticultural expert Barrie Coate, has begun to stump sprout and rejuvenate.

25-8. The EIS authors agree that the northern coastal scrub occurring in the northern reaches of Apanolio Canyon provides food and cover for wildlife, and serves to stabilize the steep erodible slopes within the canyon. The proposed project would remove this habitat in stages as the filling of the canyon progressed; however, the elevations above the active landfiling operation would remain relatively undisturbed. Because of this, the natural ability of this vegetative type to provide wildlife habitat and

prevent severe erosion would be preserved. Where canyon filling operations (i.e., landfill construction) occur, this natural habitat would be replaced by engineered drainage and sediment control structures. These structures are designed to collect and convey surface and ground-water to Apanolio Creek. This engineered system does create surface and ground-water flows that differ from those naturally occurring within the canyon. Reductions in streamflows and ground-water recharge as identified by the EIS would be mitigated through streamflow augmentation and ground-water recharge using injection wells. The EIS acknowledges the loss of naturally occurring habitat as discussed in Sections 5.3, 5.13, 5.14, and 5.16.

25-9. The virgin stand of Douglas fir forest on Scarper Peak would remain intact. These trees would continue to entrap fog and play an important role in the year-round water budget of the surrounding watershed. The small isolated stands of trees would be replaced by plantings in other locations within the canyon. According to the proposed mitigation program, these plantings would be in place prior to the removal of the existing stands.

25-10. See 25-1 and 25-2.

25-11. See 25-1 and 25-2.

25-12. The identification of sensitive species potentially occurring within the proposed project site was derived through a review of habitat types occurring in the Apanolio Canyon area and the known ranges and habitat requirements of sensitive plant, animal and invertebrate species. This approach, based on on-site investigations and consultation with appropriate experts, is accepted for this type of study.

25-13. The invertebrates investigated for potential occurrence within Apanolio Canyon were, with one exception, Category 2 candidate species (federal classification) and none received listing by the State of California. The San Francisco forked-tail damselfly is currently classified as a Category 1 species. All evaluations of potential habitat types were based upon botanical surveys of the project site (see response to comment 25-1).

Based on an update of available information on each of these species, including habitat preference and known range, Dr. Arnold maintains that none of the invertebrates would be expected to occur at the proposed project site (see Appendix B). In addition, new information indicates that the status of Leech's Skyline diving beetle may be downgraded; however, he recommends a field survey to determine the status of Ricksecker's water scavenger beetle in the sedimentation ponds in Corinda Los Trancos Canyon.

25-14. The proposed burn program would be carefully planned and implemented. Burn areas would be limited in size and would be noncontiguous. This controlled burn program would prevent complete removal of vegetation from large areas, thus reducing potential for severe erosion. Plant roots would not be removed after burning and would provide additional erosion control. Revegetation of the burned areas would be monitored for effectiveness, recovery of natural plant species, and potential erosion problems. The findings of these monitoring efforts would be used to guide future prescribed burns to maximize the effectiveness of this mitigation.

With regard to erosion and sedimentation impacts on the landfill's surface drainage system, routine monitoring and maintenance programs would identify and correct potential problems prior to impairment of the systems function.

25-15. The mitigation for riparian and fishery habitat losses that would result from the proposed project has been revised. The Mitigation Plan (Appendix B) currently includes enhancement of Corinda Los Trancos Creek through fishery habitat improvements and riparian enhancement. The components of the Mitigation Plan were derived from an evaluation of potential mitigation sites in the vicinity of Apanolio Canyon (see response to comments 5-5 and 5-21).

The monitoring program presented in the Mitigation Plan is intended to ensure that the desired habitat is developed at each defined mitigation site. Maintenance of mitigation sites may include removal of undesired species, replacement of failed plantings, and additional planting of target species if necessary.

The mitigation for steelhead habitat has been identified through the EIS process as a major concern of resource agencies. Thus, the mitigation components have been developed to maximize mitigation potential for this species. However, other wildlife species have been considered in evaluating overall habitat values associated with the various vegetation types at the proposed project site. A study of the aquatic invertebrate population within Apanolio, Corinda Los Trancos, and Pilarcitos Creeks was conducted by Mr. Thomas Payne, and is contained in Appendix B. With regard to installation of fishery enhancement structures (i.e., weirs) in unaffected reaches of Apanolio Creek, these small structures would be installed by hand under CDFG supervision. These structures would have minimal impact on riparian vegetation.

25-16. See response to comment 5-19.

25-17. Development of grasslands on the face of the proposed landfill is not intended to replace grassland habitat lost, since none occur within this area of Apanolio Canyon. This vegetation type, however, is intended to

provide diversity of habitat at the proposed project site. By managing the stabilization of the landfill's completed face with consideration of wildlife habitat, a more beneficial effect can be achieved.

25-18. The EIS presents and evaluates specific biological information generated through numerous studies of the project site and surrounding areas (see response to comment 25-1). Potential impacts to sensitive species identified have been adequately evaluated and presented. The mitigation developed for the proposed project is intended to compensate for the habitat losses identified by the EIS. The level of detail presented provides an accurate assessment of impacts and allows a comparison of alternatives to the proposed action for decision makers.

25-19. Access roads along the ridgeline west and north of Apanolio Canyon are privately owned and controlled and are not open to the public. The County has designated the project area as its preferred location for landfill development. The County is currently unaware of any GGNRA proposals to expand recreational uses into this area (Rozar, pers. comm., October 1988).

25-20. The proposed Apanolio Canyon project is designed to fulfill a need for landfill capacity in San Mateo County. Currently, San Mateo County bans out-of-county waste from Ox Mountain unless authorization is given by resolution of the Board of Supervisors to accept such refuse. It is expected that similar restriction would apply for Apanolio Canyon. Therefore, acceptance of out-of-county refuse in the future would be decided by the County Board of Supervisors.

Proposals to allow out-of-county refuse would probably depend on regional considerations, primarily the scarcity or abundance of landfill capacity within reasonable hauling distance of Bay Area population concentrations. California policy is to encourage the effective use of available regional solid waste management disposal, recovery or processing facilities. Other Bay Area Counties (e.g., Alameda and Santa Clara) have landfill capacity available; however, these jurisdictions have established conditions strictly controlling importation of solid waste. Negotiation of importation agreements can be problematic and lengthy (e.g., San Francisco has an agreement with Alameda County to dispose of its solid waste for approximately 20 years; the agreement required 6 years to negotiate.)

Should a request to import waste from other counties to the Ox Mountain facility be filed, an environmental assessment evaluating the impacts associated with the proposed action would be prepared. This was the case in 1986 when the Board of Supervisors was considering the possibility of allowing San Francisco solid waste to be disposed of in Apanolio Canyon. A Supplemental EIR was prepared for this proposal.

25-21. These areas within the Ox Mountain Ranch would serve as buffer areas during development of the Apanolio Canyon project. Future use of these properties would be subject to similar permitting actions and review. Therefore, development of these parcels would occur only as approved by responsible agencies (e.g., County of San Mateo, Coastal Commission).

25-22. A discussion of the potential development scenarios in Nuff Canyon is presented in EIS Section 3.3.

25-23. Recycling is discussed in the "Alternative Technology" portion of the No Action alternative. See Section 3.5e for additional discussion of recycling programs and responses to comments 22-9 and 22-31 for recycling influences on landfill demand.

Responses - Comment Letter 26

26-1. Upper Apanolio Creek does not appear to support a steelhead fishery. Downstream segments of the creek would not be impacted by landfill operation since BFI has developed a flow augmentation plan and Contingency Remedial Action Plan to protect quality and quantity of water below the landfill site. For discussion of the steelhead fishery see response to comment 5-22.

26-2. The EIS presents the information available to the report authors up to the time of publication. The structure of the document and nature of the evaluation is intended to be void of bias in either a resource sense or project proponent sense. This posture is often perceived as a bias when a high degree of controversy exists for a proposed action. Additional information that has been developed since publication of the DEIS, partially in response to the comments generated during the review period, is presented in this FEIS and its attached appendices.

26-3. Apanolio Creek, within the project area, is a rainbow trout stream. See response to comment 5-22.

26-4. See response to comment 5-22.

26-5. See response to comment 5-22. A report prepared by Hydrocomp, Inc. evaluates the hydrologic conditions of the lower Bongard dam. A copy of this report is provided in Appendix B.

26-6. The Phil Williams study was not based on confirmed streamflow figures or barrier characteristics as stated in the study. See response to comment 23-18.

26-7. Using detailed site-specific information (see response to comment 23-18) and through study of existing fishery data by Mr. Tom Payne (see response to comment 5-22), it has been determined that the fishery within the project area in Apanolio Creek should be considered resident trout.

26-8. An aquatic invertebrate study was conducted by Mr. Thomas Payne to provide information on invertebrate populations and diversity in Apanolio, Corinda Los Trancos, and Pilarcitos Creeks. The results of the study indicated the presence of benthic macroinvertebrates at all five sites sampled (see Appendix B). No predominance of any one invertebrate taxa was observed. Stoneflies, a taxon considered a clean water sensitive group, occurred at all sites, indicating relatively good water quality. Based on the results of the sampling data, an adequate food base for trout exists in the sampling areas where the required physical habitat is also present.

26-9. Alder and willow riparian areas would be eliminated along Apanolio Creek in the project area. Riparian habitat would not be significantly altered from the sediment basin outflow to the BFI property line and would continue to provide an aquatic invertebrate food source. To mitigate potential productivity losses, a stream enhancement program has been developed for Corinda Los Trancos Creek (see Mitigation Plan, Appendix B). Included in this plan is stabilization and replanting of Corinda Los Trancos streambanks, including planting of willow and alder seedlings. These plantings would provide a source of detritus to the stream ecosystem.

26-10. The existing water quality and quantity of Apanolio Creek flows would be maintained via the streamflow augmentation program. Water used for flow augmentation would be derived from storm flows in the Corinda Los Trancos Creek basin, as well as water wells in the Corinda Los Trancos and Apanolio Creek watersheds. Water appropriate for supporting a trout fishery would be ensured.

26-11. There would be no decrease in the volume of flow in Apanolio Creek below the landfill on BFI property. Water would be pumped from hydraugers and wells and if need be, pumped over the ridge from ponds located in Corinda Los Trancos Canyon. See response to comment 5-7.

26-12. The Corinda Los Trancos Canyon landfill is an example of an existing landfill which was constructed in a similar environment to the proposed Apanolio Canyon Expansion Site. The expansion site design represents the current state-of-the-art and complies with Subchapter 15 regulations which require water quality and quantity protection.

26-13. See responses to comments contained in letter 5.

26-14. The HVA System is adapted from the federal Habitat Evaluation Procedure. See response to comment 5-19 for an explanation of the Habitat Methodology.

26-15. See responses to comments 5-18 through 5-26.

26-16. The EIS does not justify the previous actions of either BFI or San Mateo County in regard to screening alternative sites or evaluating the alternatives considered in detail. It is the responsibility of the Corps to consider all potential impacts from its decision on the 404 permit. This balancing of impacts associated with a project includes consideration of local (i.e., San Mateo County) planning documents, public need, and natural resource impacts.

Responses - Comment Letter 27

27-1. The Mitigation Plan has been revised based on additional studies and comments received on the Draft EIS (see Appendix B).

27-2. See response to comment 5-19.

27-3. BFI would maintain and monitor the mitigation projects for 5 years as stated in the Mitigation Plan.

27-4. Comment noted.

Responses - Comment Letter 28

28-1. See response to comment 5-7 regarding protection of downstream fishery habitat.

28-2. It has been determined that leachate is not leaving the Corinda Los Trancos landfill containment area and is not entering the downgradient aquifer. Contamination found in a downgradient well has been traced to a surface spill of leachate during handling at the leachate storage tank and is an isolated event. It also has been determined that contamination in a downgradient private well is due to an adjacent treated wood from which creosote has leached.

28-3. A discussion of out-of-county disposal is contained in Section 3.3 of the EIS. The EIS discussion of recycling and alternative technology (Section 3.5e) also has been expanded.

Responses - Comment Letter 29

29-1. There would be no reduction in flows in Apanolio Creek. See response to comment 5-7. It is expected that the sediment control structures would benefit the fish habitat by lowering the amount of sand and silt contribution to the lower reaches of the creek.

29-2. There are no adverse impacts anticipated to the watershed as a result of the landfill. See response to comment 5-29.

29-3. Although the stream and adjoining riparian habitat are interrelated, each of the habitat values were considered separately for clarity. Combining these values as suggested by the commentor, would produce the combined impact.

29-4. Comment noted. See Appendix B for the San Francisco garter snake study conducted by Sam McGinnis. In addition, see response to comments 3-2 and 5-7 regarding protection and maintenance of water quality and quantity in Apanolio Creek.

29-5. See response to comment 5-7.

29-6. See response to comment 5-22.

29-7. See responses to comments 23-18 and 5-22 for discussion of the effectiveness of the downstream barrier and interpretation of the fishery data available.

29-8. See response to comment 16-14 for funding of modifications. The fishery in the proposed project area has been determined to be resident rainbow trout (see response to comment 5-22). The loss of this fishery is not viewed as insignificant. Because of its importance, BFI has developed mitigation components that would enhance fishery habitat and/or migration access to Arroyo Leon, Pilarcitos, Corinda Los Trancos, and San Pedro Creeks (see Mitigation Plan, Appendix B).

29-9. Recycling efforts are discussed in Section 3.5e of the EIS.

29-10. The alternative sites have been evaluated based on fish and wildlife criteria. Although these resources are important, other resource and socioeconomic impacts must also be considered. Also see response to comment 22-8.

Responses - Comment Letter 30

30-1. Resource recycling programs in San Mateo County currently divert 22 percent of the total solid waste stream from the County's landfills. Goals of future programs planned for implementation would divert an additional 13 percent for a total diversion of 35 percent. See section 3.5e for additional discussion of recycling programs.

30-2. With regard to the fragmented nature of the mitigation components see response to comment 5-5. In addition, the Mitigation Plan has been expanded based upon comments received on the Draft Plan and consultation with the CDFG.

30-3. The status of resource recycling in San Mateo County is presented in Section 3.5e. The effect of these recycling programs on the life-span of the project and its alternatives is discussed in responses to comments 22-9 and 22-31.

30-4. Out-of-county landfill disposal was considered in the alternatives analysis portion of the EIS. At that time, it was determined that this solution would be more costly and would be problematic. The environmental impacts associated with an out-of-county alternative could be determined only after a site has been identified and an application to the lead agency has been filed. At that time, impacts would be determined and appropriate mitigation measures would be developed.

30-5. The costs contained in the EIS are intended to serve as numbers for comparison of alternative site development. These numbers are as detailed as preliminary/conceptual engineering design of alternative site development allows. With regard to savings from recycling programs, the County and its cities currently divert an estimated 22 percent of their waste stream from the County's landfills. Additional plans are proposed to reduce waste streams to landfills by a total of 35 percent. Discussion of the cost effects of these recycling efforts is provided in response to comment 22-31.

30-6. The capacities of potential landfill locations are presented in Table 3.4-1 and Table 3.4-2. Through the site screening process, smaller sites were eliminated for various reasons (e.g., location on bayland or proximity to Holocene fault). The sites that would potentially reduce environmental impacts associated with the proposed action are carried through the EIS in detail. The effect of resource recycling on the life-spans of these alternatives is presented in response to comment 22-9.

30-7. It should again be noted that the Apanolio Canyon Expansion Site project plans call for a 5-foot-thick subgrade barrier and a 1-foot-thick bentonite clay treated liner. This design has been analyzed for slope

stability under accelerations determined by the maximum probable earthquake and has been found to be adequate for the site. The subgrade barrier and liner are designed to meet or exceed the requirements of Subchapter 15.

30-8. See response to comment 5-21.

30-9. The "fragmented" mitigation plan is almost entirely within the Pilarcitos drainage. The proposed mitigations are intended to, as the commentor states, improve habitat values in this drainage. Several barriers and denuded areas are scheduled for mitigation projects to enhance the existing habitat potential.

30-10. The proposed mitigation plan would provide maintenance of flows within the Apanolio Canyon project area. In addition, stream channel enhancement plans would be implemented in Corinda Los Trancos Creek. Water quality in Apanolio Creek would be protected from leachate contamination via the Contingency Plan developed for the site.

30-11. See response to comment 5-23 for discussion of the upland burn program.

Responses - Comment Letter 31

31- See comments and responses from letter 30.

Responses - Comment Letter 32

32-1. Preliminary discussions have occurred between San Mateo County and jurisdictions that could potentially receive the County's solid wastes. The intent of these discussions has been to define the actions required to negotiate an agreement and meet all permit and environmental review requirements. These actions are briefly discussed in Section 3.3 of the EIS.

32-2. Additional information has been provided in EIS Section 3.3 regarding out-of-county disposal options.

Responses - Comment Letter 33

33-1. The current status of incineration projects and other alternative technologies are presented in Section 3.5e of the EIS.

33-2. Reference to the Nejedly-Z'berg-Dills Solid Waste Management and Resource Recovery Act of 1972 has been incorporated.

33-3. The appropriate reference has been incorporated into the EIS.

33-4. The appropriate reference has been incorporated into the EIS.

33-5. Landfill siting studies conducted in San Mateo County in 1963 and 1987 identified potential landfill development sites. Using the criteria presented in the EIS, all potential sites identified by these studies were evaluated. This evaluation indicated that Corinda Los Trancos and Nuff Canyons were the only sites that appeared to provide long-term landfill capacity for San Mateo County while potentially reducing the environmental impacts associated with the proposed action. Therefore, these sites, considered to be the most viable, were carried through the EIS process as alternatives.

The disposal of San Mateo County solid wastes at an out-of-county site was included in the No Action Alternative along with alternative technology (i.e., resource recovery). The environmental impacts associated with out-of-county disposal could be similar to impacts identified for the in-county alternative sites. However, the time required to negotiate and permit out-of-county disposal is difficult to predict. Without identification of a specific out-of-county site, detailed environmental evaluation of this alternative is not possible.

Frenchman's Creek and Arroyo Leon Canyons were eliminated primarily for impacts associated with site access. Development of Frenchman's Creek Canyon would require use of city streets in Half Moon Bay by trucks delivering solid wastes to the landfill. Use of Arroyo Leon Canyon would require construction of an intersection along Route 35, a scenic highway. Use of either site would create land use impacts and would impact fishery and wetland habitat. Thus, it was determined that neither of these sites provided a feasible alternative to the proposed action in that environmental impacts may not be reduced.

33-6. The fishery within the proposed project area has been determined to be resident rainbow trout; therefore, no direct impact to anadromous fisheries would be anticipated from project construction. Streamflow augmentation and remedial action, in the event of failure of the landfill's leachate containment system, should prevent degradation of downstream beneficial uses of waters in Apanolio and Pilarcitos Creeks. Thus, no impact to commercial fishery resources would be expected.

33-7. The List of Preparers (Chapter 8.0) has been revised to include additional information.

33-8. See revised EIS Figure 3.5-7, which shows filter fabric for the ground-water collection system.

33-9. Extensive and thorough geological studies have been performed by Purcell, Rhoades & Associates in the Apanolio Canyon eg. Purcell, Rhoades & Associates' reports dated May 21, 1986, October 14, 1987, January 26, 1987, March 30, 1987, April 16, 1987, May 30, 1987, January 29, 1988. Apanolio Canyon is not geologically unique compared to similar coastal canyons in San Mateo County.

33-10. Investigation of the effects of leachate on the concrete used for the construction of the leachate collection system was conducted in two phases. First, a theoretical approach was taken by consulting with an authority on cement chemistry to determine if any chemical compounds in the leachate could cause long-term durability problems for concrete; and secondly an experimental program was initiated to determine the durability of the actual concrete materials proposed for the landfill site.

Professor P. K. Mehta of the University of California Berkeley, is an authority on cement and concrete chemistry. Professor Mehta reviewed pertinent information and determined that, based on leachate composition from Corinda Los Trancos Canyon, the concentrations of chemicals could be considered similar to mild sea water with regard to potential effects on concrete mixtures. Guidelines were developed by Professor Mehta, defining that the concrete should have relatively low permeability and alkalinity, and well-graded aggregates free from alkali-reactive impurities should be used.

Laboratory testing of representative materials was conducted using leachate from the Corinda Los Trancos landfill. Concrete and aggregate samples were submerged in leachate maintained at 130°F, and control samples submerged in water at 130°F. The concrete and aggregate samples were exposed for four months and seven months, respectively. Currently, additional testing is being conducted (i.e., long-term durability test for 1 year). To date, no detrimental effects of leachate have been measured or observed. (Haynes & Associates, May 20, 1988.)

The filter fabric encasing the gravel of the leachate collection and removal system is expected to last for the entire site life. It is a synthetic, durable material resistant to degradation in contact with leachate.

33-11. There would be two (2) ground-water monitoring wells located downgradient from the proposed grout curtain.

33-12. Cover material for the landfill would be from on-site sources. The existing alluvium, colluvium and weathered bedrock would be excavated prior to construction of the underdrain and subgrade barrier. The excavation spoils would be stockpiled on BFI property for later use as daily and final cover.

33-13. The acrylamide resin grout specified for the grout curtain is currently being analyzed for resistance to degradation by contact with leachate.

Responses - Comment Letter 34

California Department of Fish and Game Letters (July 25 and August 15, 1988).

July 25, 1988

34-1. Comments noted. Specific comments on the DEIS alternatives analysis, biological resource evaluation and mitigation plan are provided as response to the individual comments that follow.

34-2. The Corinda Los Trancos alternative is less damaging to several resources than the proposed 1,200-foot Apanolio Canyon alternative. Although several resource impacts can be quantified (e.g., acreage of Corps wetland), and are thus easily compared, comparison of impacts to other resources is more subjective. Factors used in the Corps decision process will include cost feasibility and socioeconomic impacts. Thus, the decision to approve or deny the permit application will be derived from a consideration of all potential impacts related to the proposed development. It should be noted that the references to the "preferred alternative" in the DEIS is not the Corps preferred alternative, but rather the applicant's preferred alternative.

34-3. The methodology used in the Mitigation Plan to assess the "value" of the existing habitat and habitat created or enhanced by the mitigation components is discussed in response to comment 5-19. In addition, the values used in the evaluation have been revised (see Mitigation Plan, Appendix B).

34-4. The Mitigation Plan contained in Appendix B of this EIS has been revised based upon comments received on the DEIS. Currently, the Mitigation Plan is being reviewed by California Department of Fish and Game and U.S. Fish and Wildlife Service personnel. It is through the EIS process and the review by these individual agencies that the proposed mitigation measures will be reviewed.

34-5. Comment noted. The California Regional Water Quality Control Board comments on the DEIS are presented in letter 21.

34-6. Comment noted.

34-7. See response to comment 22-8.

34-8. See response to comment 22-9 for a discussion of combinations of alternatives, and response to comment 22-7 for discussion of the 25-year criteria used by the county.

34-9. See response to comment 22-8 for inclusion of fish and wildlife criteria in the alternatives analysis.

34-10. The assessment of the impact comparison presented in this comment is consistent with the information presented in the EIS. However, potential impacts associated with "Transportation and Circulation"; "Air Quality"; and "Noise" are impacts areas that would be similar for all alternatives, with the life-span (i.e., duration of impact) of the alternative being the only characteristic to compare. It is difficult to compare a 93-year site to a 16 or 27-year site. The impacts at these sites would be similar until closure of the site, after which impacts would be shifted to wherever wastes are hauled.

34-11. Comment noted. The Apanolio Canyon site would be buffered from public view by private lands held by BFI. Access to vantage points would be limited to private roads. The greater impact to aesthetics resulting from the Corinda Los Trancos alternative as stated in the EIS is based upon the visibility of the site from population centers, highways, residences, and recreation areas.

34-12. Comment noted. The determination of whether to prepare an EIR or EIS for a project in either Nuff Canyon or Corinda Los Trancos Canyons would be a decision by the lead agencies(s) defined. Also see response to comment 24-11.

34-13. See response to comment 22-7 for a discussion of the 25-year site capacity. The County's goal of a long-term site could be met by a site having a capacity of 25 years or more.

34-14. The County is currently pursuing additional recycling programs. Section 3.5e of the EIS has been expanded to include additional information on recycling activities within the County. Currently, the County is recycling (or diverting) approximately 22 percent of its solid waste stream from landfills. The goal of the County's recycling efforts is to achieve a 35 percent diversion of materials from its landfills. The effects of recycling on the life-spans of the proposed alternatives is discussed in responses to comments 22-9 and 22-31.

34-15. Comment noted. Determination of the level of impact resulting from alternatives with great differences in life-span is difficult. It should be noted that the impacts resulting from the Corinda Los Trancos or Nuff Canyon alternatives would be diverted to a future as yet identified disposal site upon closure of these disposal areas.

34-16. Incorporation of the post-closure monitoring and maintenance costs over the projected life of the alternatives would result in an annual cost of \$1.58 million for the 1,200-foot Apanolio Canyon alternative, \$3.72 million for the 850-foot alternative, \$5.17 million for the Corinda Los Trancos Canyon alternative, and \$3.97 million for the Nuff Canyon alternative. These additional costs would result in per cubic yard costs of \$1.18, \$3.36, \$4.79, and \$3.55 respectively.

The increased cost of site preparation in both the Corinda Los Trancos and Nuff Canyon alternatives results from the need to excavate large volumes of alluvial and weathered bedrock material prior to construction of the landfill's liner and leachate collection systems.

Costs associated with community services and potential physical environment impacts could not be estimated accurately. It should be noted that the shorter lifespan alternatives would result in diversion of these costs to another site upon closure, and may not result in a lesser overall economic impact. In any case, it is questionable that a cumulative cost associated with community services and physical environment risks would significantly weight the alternative sites in favor of the 1,200-foot Apanolio Canyon alternative strictly from a cost perspective.

34-17. Comment noted.

34-18. Comment noted. The Corps will evaluate the impacts associated with the alternatives presented in the EIS. Factors that will be considered are not limited to impacts to the physical environment.

34-19. The study of the potential presence of the San Francisco garter snake at the site has been completed (see response to comment 5-6). A contingency plan has been developed to define corrective actions in the event of a failure of the landfills leachate containment system. This plan is presented in Appendix D.

34-20. The questions regarding the navigability of the Bongard diversion and the classification of the fishery above this diversion are discussed in responses to comments 5-22 and 23-18.

34-21. See response to comment 5-39.

34-22. The discrepancy in the quantity of land subject to Corps jurisdiction is discussed in response to comment 23-20. In addition, detailed wetland surveys have been conducted in Corinda Los Trancos and Nuff Canyons. The results of these surveys are presented in Chapters 4 and 5 of the EIS.

34-23. See response to comment 5-22 regarding the fishery in the project area.

34-24. The contingency plan for the proposed project will be reviewed by the RWQCB. Through this review, appropriate monitoring of surface and ground waters, and corrective actions would be defined. A copy of the current plan is provided in Appendix D.

34-25. The congestion currently occurring during the a.m. and p.m. peak-hour periods on Highway 92 results from commute traffic and truck traffic. The restrictions placed upon truck access to the Ox Mountain facility are intended to prevent additional traffic congestion along this route.

34-26. Comment noted. Detailed responses are provided for each of the items below.

34-27. Comment noted.

34-28. The text and tables contained in the Mitigation Plan have been revised (see Appendix B). The Plan indicates that replanting actions would require 10 years to reach full habitat value.

34-29. Comment noted. See response to comment 16-9.

34-30. See responses to comments 5-22 and 23-18.

34-31. The fishery value has been revised for Apanolio Creek (see Mitigation Plan, Appendix B).

34-32. The status of the fishery in the northern portion of Apanolio Creek is discussed in response to comment 5-22.

34-33. Implementation of the placement of instream structures would have a very limited impact to surrounding terrestrial habitat. The intent of these structures is to improve the fishery habitat within the unaffected reach of Apanolio Creek. Installation of these structures would be supervised by CDFG staff. Flow reduction in Apanolio Creek during summer dry periods would be mitigated through a streamflow augmentation plan (see Appendix D). This would ensure Apanolio Creek flows within BFI property.

34-34. Based upon comments received on the Mitigation Plan, the habitat values have been revised (see Mitigation Plan, Appendix B).

34-35. The species referenced have been eliminated from evaluation of the existing habitat.

34-36. BFI and its consultants have attempted to provide on-site, in-kind compensation for the loss of riparian/wetland habitat in Apanolio Canyon. Attempts to identify mitigation sites within the Canyon were unsuccessful. Through investigation of habitat characteristics within the Pilarcitos Creek watershed, several potential opportunities were identified that would provide meaningful mitigation. The Mitigation Plan (Appendix B) is the result of these efforts.

The enhancement and creation of riparian/wetland areas within the Pilarcitos Creek drainage is intended to compensate for the loss of 11 acres of riparian (including 3.43 acres of Corps wetland) habitat within the proposed project site. The 1.5:1 recovery of riparian habitat is intended to compensate for varying habitat type.

34-37. The sediment basin's perimeter would be revegetated with riparian plant species. The establishment and maintenance of undisturbed perimeter habitat would be ensured through the basin's limited access for cleanout (see Mitigation Plan, Appendix B).

34-38. See responses to comments 23-45 through 23-48. The EIS provides a qualitative discussion of resources present in the project area (summarized in Table 5.3-1) and indicates the extent of each vegetation type (i.e., acres) that would be impacted.

34-39. Loss of upland habitat is intended to be compensated for through several habitat enhancement/creation projects. Measures identified by the Mitigation Plan include Douglas-fir plantings, prescribed burning of old growth scrub vegetation, creation of water features in the upper portions of the watershed including a wildlife pond near Scarfers Peak, and development of a grassland cover along the face of the proposed fill. Thus, none of these proposed mitigations is intended to individually compensate for loss of upland habitat; however, it is when they are considered cumulatively that they are intended to compensate for habitat loss.

34-40. The habitat methodology used to assess existing and created habitat values is discussed in response to comment 5-19. In addition, the values contained in the Mitigation Plan have been revised (see Appendix B).

34-41. See responses to comments 34-34 through 34-37.

34-42. The barriers included in the mitigation for the proposed project have been identified by CDFG staff as being effective. Correction of these barriers would allow consistent low winter flow access to the upper reaches of these streams.

34-43. The proposed sediment basin design for the proposed Apanolio Canyon project differs from the existing basin in Corinda Los Trancos Canyon. The instability of the Corinda Los Trancos Creek banks contribute to the increased bed load of this stream.

34-44. The predicted reduction of Apanolio Creek summer low flows in the later years of the proposed project life would be mitigated through a streamflow augmentation plan. This plan would provide maintenance of existing low flows on the BFI property (see Appendix D).

34-45. Comment noted.

34-46. Comment noted.

August 15, 1988

Response to comments contained in this revised CDFG letter correspond to the responses provided in 34-1 through 34-6 in the Department's July 25, 1988 letter.

9.5 Public Hearing Comments and Responses

Speaker 1: Tom Nolan, Supervisor

Mr. Nolan stated that without the use of Apanolio Canyon as the County's landfill site, 25 years of cooperative effort in local land use planning would be destroyed, and individual collection agencies would be forced to search for alternative disposal sites.

Mr. Nolan commented that although he believed that the EIS was very good, he thought the EIS could state more thoroughly perhaps the history of how we (San Mateo County) have vigorously searched for and evaluated alternate sites, both within and outside of the County.

S1-1

Supervisor Nolan stated that disposal of San Mateo County solid wastes in Alameda County (Altamont) would require more time to negotiate (referencing San Francisco and their 6 years of negotiation with Alameda County) than San Mateo County has. In addition, the Altamont facility does not have the capacity at this time to accommodate San Mateo County wastes and if an agreement were reached, residents would be faced with increased annual costs. Disposal in Santa Clara County landfills is also complicated by jurisdictional regulations.

S1-2

Regarding the Nuff Canyon alternative, Mr. Nolan explained that although this site appears to offer a solution the Canyon is designated as a significant regional mining resource.

Supervisor Nolan also expressed that he feels the wildlife evaluation and mitigation plan contained in the EIS allows enhancement of the Pilarcitos Creek watershed for wildlife and fisheries far in excess of impacts from the Apanolio Canyon project.

Speaker 2: William J. Schumacher, Supervisor

Supervisor Schumacher stated that in the late 1960s and early 1970s San Mateo County had a Solid Waste Disposal Committee (folded into the Regional Planning Committee) to work cooperatively to solve the County's waste disposal problems. Mr. Schumacher explained that public opposition to siting landfills is understandable; however, a county of 600,000 residents needs a landfill site.

Mr. Schumacher explained the difficulties encountered by San Francisco in identifying and negotiating a disposal site for their solid wastes. The proposal for development of Apanolio Canyon is a state-of-the-art design would be developed on a site planned for this use for 20 years. Mr. Schumacher stated that he feels every possible environmental impact has been identified and mitigated and that every safeguard possible in modern technology to preserve downstream environments has been incorporated.

Speaker 3: Paul Scannell, Assistant County Manager

Mr. Scannell stated that the County's Public Works and Environmental Management departments had reviewed the draft EIS. He commented that the EIS validates the original work performed in 1984 (County's EIR) and in addition updates information and adequately evaluates all the practical alternatives to the proposed project. Providing disposal for 600,000 people, Apanolio Canyon provides a location which minimizes the impact to the community at large. Mr. Scannell also stated that the County would support any feasible measures that would alleviate impacts identified.

The Ox Mountain Ranch, Mr. Scannell explained, was identified over 25 years ago through a process involving citizens and elected officials. The planning decision to make Ox Mountain the County's waste facility received a great deal of study and consideration.

With regard to alternatives, Mr. Scannell indicated that out-of-county sites are constrained legally and politically. These are real constraints that require the County to site its own disposal facility within its own boundaries. The County does not support the Nuff Canyon alternative which would simultaneously develop a rock quarry and a landfill. Additional truck traffic would create public safety problems.

Mr. Scannell indicated that the Recycling Task Force, created by the Board of Supervisors, has engaged a number of projects to benefit recycling efforts in the County. Currently the County is recycling 23 percent of its waste stream, with goals to reach 35 percent diversion. Even with these goals, Mr. Scannell explained, a great deal of solid waste requires disposal. Additionally, the existing landfill will reach capacity in late 1989, leaving the County with no solid waste disposal capacity.

Speaker 4: Lewis Roe, City of San Mateo

Mr. Roe indicated that the City of San Mateo has participated in studies for many years in an attempt to replace the facility formerly used. The previous landfill used by the city was a bayside facility which was required to close whereupon the City began using the Ox Mountain landfill. Mr. Roe noted that the City of San Mateo agrees with the statements made by Supervisors Scannell and Schumacher and Mr. Paul Scannell.

Speaker 5: David Nakayama, Field Representative to State Assemblywoman Jackie Speier

Mr. Nakayama stated that Assemblywoman Speier has worked on this issue both as a County Supervisor and State Assemblymember and is convinced Apanolio Canyon is the only site for the disposal of the County's solid waste. San Mateo County's landfill is nearing capacity and we must move quickly.

Assemblywoman Speier also will continue to work for an environmentally sound, efficient and cost-effective solid waste disposal program. BFI will meet governmental regulations that guarantee environmental and public protection. Their commitment of resources and San Mateo County's recycling programs are illustrative of intelligent concerning approach to public need. Assembly Bill 3298 will enhance recycling efforts. Apanolio Canyon makes sense environmentally and economically and is important to some 600,000 residents.

Speaker 6: Paul Formosa, South San Francisco Scavenger Company

Mr. Formosa explained that the South San Francisco Scavenger Company services South San Francisco, Brisbane and Millbrae. They currently handle waste for about 20,000 residents and 5,000 businesses, and handle 500 tons of waste per day. San Francisco Scavenger Co. and other independent companies have an obvious stake in this project.

A quick approval is required for the project since construction of the landfill would require one year. Any gap in the closing of the existing landfill and the Apanolio Canyon site would leave companies without a disposal site. Mr. Formosa stated that they are successfully working with several cities to establish curbside recycling programs and are making every effort to reduce waste volumes.

Speaker 7: A. G. Fannucci, Resident

Mr. Fannucci commented that he was in favor of keeping Ox Mountain as the County's disposal site, since rates will increase if BFI has to dump somewhere else. He also stated that the environmental impact associated with Ox Mountain is not of a sufficient degree to close the site.

Speaker 8: Vincent Cozzolino, Resident Businessman

Mr. Cozzolino explained that he resides and operates a flower growing enterprise of approximately 212 acres immediately adjacent to Highway 92, just south of the entrance to the Ox Mountain Sanitary Landfill. Mr. Cozzolino stated that he has found BFI to be courteous and very cooperative and he has never had any problems related to the operation of the landfill. The growth in automobile and truck traffic has been enormous, Mr. Cozzolino explained, primarily due to population growth around Half Moon Bay, El Granada and Moss Beach. This increase along with heavy recreational traffic on weekends have caused delays along this route, however, Mr. Cozzolino does not believe this is caused by the landfill operation.

Speaker 9: Hank Sciaroni, Resident

Mr. Sciaroni stated that he was County Director and Farm Advisor for Cooperative Extension, University of California for San Mateo and San Francisco Counties for about 38 years. During that time he had opportunity to work with San Mateo Scavenger Company and BFI and feels that they run an exemplary operation. Mr. Sciaroni reflected that prior to opening of Ox Mountain garbage was commonly disposed of on site in the rural areas and littered the sides of roadways. These disposal practices have been minimized since opening of Ox Mountain. These operations often polluted marshes and streams and lead to increases in vector populations. He fears that if the landfill is not permitted, disposal practices of this type will again occur. The demand for disposal areas for the recreational activities along the Central Coast and increasing population is enormous Mr. Sciaroni explained.

Mr. Sciaroni provided BFI with hydrogeological information from his files which included rainfall records, watershed characteristics, well logs, water quality information, and studies conducted by the University when they began investigations to develop Apanolio Canyon. Mr. Sciaroni urged the Corps to move as soon as possible to approve the permits for the landfill expansion.

Speaker 10: Joseph Zucca, Resident

Mr. Zucca explained that he is a former Mayor and City Councilman of Belmont and a former member of the Board of Directors of the South County Garbage and Refuse Disposal District (representing Belmont, San Carlos, Redwood City, Woodside, Menlo Park and East Palo Alto). Mr. Zucca referenced the operation of the Marsh Road dump, the private portion having been operated by BFI. He commented that BFI was always reliable, efficient, and followed all rules and regulations. This facility was forced to close when it reached capacity and after a great deal of uncertainty, refuse was diverted to the newly opened Ox Mountain Sanitary Landfill. If this operation is not permitted it could be tragic to San Mateo County.

In Mr. Zucca's opinion, based on his review of the EIS, that a landfill could be developed in Apanolio Canyon, it can be environmentally safe, and adjacent habitats can be improved.

Speaker 11: Mary Griffin, Supervisor

Supervisor Griffin explained that she is Vice President of the Board of Supervisors of San Mateo County and Chair of the San Mateo County Recycling Task Force. She stated that 25 years ago, county officials selected Ox Mountain as their long-range disposal site and that the EIS does a complete, accurate analysis of the impacts and alternatives regarding Apanolio Canyon and urged the EIS be finalized and approved.

Supervisor Griffin indicated that San Mateo County seriously considers waste management and disposal and is in the forefront in voluntary residential curbside recycling. However, she explained, even with recycling, the County will still need long-term landfill capacity.

The EIS should reflect that curbside recycling is currently under way, she commented, and further programs will be implemented soon, including plans to expand the recycling efforts to commercial areas. She concluded that Ox Mountain is the preferred site supported by public discussion and elected officials for the past 25 years.

S11-1

Speaker 12: Mario Torrigino, Coastside Scavenger Company

Mr. Torrigino stated that the Coastside Scavenger Company services the City of Pacifica. He explained that the people of San Mateo County would like to continue to have reasonable garbage rates and recommended approval of the Corps permit.

Speaker 13: Gilbert Gossett, Resident

Mr. Gossett, residing immediately downstream from the BFI property in Apanolio Canyon, expressed concern for the quality and quantity of both the ground water and surface water in the lower Canyon. He explained that the EPA maintains that landfill liners do eventually fail, and that failure would result in adverse affects on the beneficial uses of Apanolio and lower Pilarcitos creeks.

S13-1

The existing operation, Mr. Gossett explained, has caused increased litter (windblown) on his property and that movement of the landfill into Apanolio Canyon would increase further increase these problems. Preliminary operations have caused a decrease in sensitive wildlife species while varmint populations have increased.

S13-2

Mr. Gossett further commented that although recycling efforts are being discussed, as long as landfill capacity is available, this method of disposal will be pursued rather than other methods such as the cogeneration incinerator once proposed in Redwood City. By using alternative methods, irreversible destruction of natural resources can be avoided. He added that conversations with County officials in 1978 indicated that there were no plans for development of the Apanolio Canyon portion of Ox Mountain.

S13-3

Speaker 14: Karen Miller, U.S. Fish and Wildlife Service

Ms. Miller commented that the Service has reviewed th Draft EIS and has extensive comments that will be included in the Department of Interior letter on the DEIS. Ms. Miller explained that it is the policy of the Service to recommend against projects involving the destruction or

degradation of valuable aquatic habitats. Based on this, she identified the Nuff Canyon and Corinda Los Trancos alternatives as preferable since they would decrease the losses of fish and wildlife habitat. She also noted that an adequate mitigation plan for fish and wildlife habitat was not presented in the DEIS. As a final statement, Ms. Miller indicated that the Service recommends adoption of either the no-project or the Corinda Los Trancos (with appropriate mitigation) alternatives.

S14-1

Speaker 15: James Hamilton, California Trout

Mr. Hamilton stated that his review of the draft EIS identified several deficiencies. Mr. Hamilton indicated that all evidence suggests fish in Apanolio Creek are steelhead and this conclusion has been collaborated by a broad consensus in California Department of Fish and Game and the U. S. Fish and Wildlife Service. He also indicated that steelhead populations are now at one-third of their historic numbers.

S15-1

Mr. Hamilton commented that the DEIS fails to include an examination of the aquatic and invertebrate population (a significant food source for fish) in Apanolio Creek. The alder forest is part of the food source for invertebrates and elimination of the alters upstream of the toe of the proposed landfill would cause a severe impact on the streams ability to provide a food source for downstream fish populations.

S15-2

Speaker 16: Joseph Bergeron, San Mateo Planning Commission

Mr. Bergeron urged the Corps to approve the BFI permit. He stated that he has found BFI to be competent and cooperative and feels that the Apanolio Canyon is a worthwhile project needed by San Mateo County.

Speaker 17: Henry Bostwick, Jr., Executive Vice President and General Manager of the San Mateo County Economic Development Association

Mr. Bostwick stated that he is supportive of the proposed project. He acknowledged that the issue of solid waste disposal is a tremendously important problem that does not only affect the environment, but also the economic structure within the county. Mr. Bostwick explained that service of solid waste disposal is important to the employees and employers in the County.

Speaker 18: Albert Teglia, Council of Mayors

Mr. Teglia, as the Mayor of the City of Daly City and representing the Council of Mayors of San Mater County, stated that the EIS is complete and serves the people's needs. The Council of Mayors represents 20 cities in the County, which accounts for 95 percent of the approximately 600,000 population, and would like to go on record as supporting the proposed

Apanolio Canyon project. Mr. Teglia explained that although recycling efforts are under way, the Apanolio Canyon project will still be needed.

Speaker 19: Michael Mahoney, Administrative Assistant for State Assemblyman Bill Duplissea

Mr. Mahoney, representing Assemblyman Bill Duplissea, commented that Assemblyman Duplissea feels that the EIS does a good job in describing the impacts and their mitigation, however, the document should state more strongly the landfill crisis that is facing our State. San Mateo's neighboring counties have no long-term landfill capacities and Santa Clara, while it does have landfill capacity, is sending signals that out-of-county waste is not welcome. As the EIS concludes, no impact to any State or Federally-listed, threatened or endangered species would be likely to occur with the expansion into Apanolio Canyon. Assemblyman Duplissea feels the EIS provides an equitable wildlife and fisheries mitigation plan that will significantly improve the habitat and fisheries of those areas.

S19-1

In addition, Assemblyman Duplissea comments that the EIS should also contain at least a small section on the human impact and economic impact that would occur if the proposed project is not approved.

S19-2

Speaker 20: Karen Garrison, Urban Creeks Council and the Northern California Federation Council of Flyfishers

Ms. Garrison stated that the Urban Creeks Council is an organization with 1,700 affiliates statewide. Ms. Garrison explained that because of the remoteness and size the habitat within Apanolio Canyon is qualitatively different with regard to biological diversity, stream productivity, and habitat value than neighboring canyons.

Based on this, Ms. Garrison stated that the EIS systematically plays down this order of magnitude difference in habitat value. The people are relying on the Corps to take a longer view of the impacts resulting from the proposed project and alternatives. Ms. Garrison also stated that the selection of alternatives in the EIS is bias in that all sites evaluated are similar in kind. The EIS should evaluate the option of disposal in an out-of-county landfill, such as Alameda County's Altamont facility, which is currently seeking to expand capacity to 300 years. The potential for an interim agreement with an out-of-county site to allow more time for environmental review should also be presented. Combining an interim agreement with recycling could extend the life of each of the alternatives. A cooperative landfill/quarry appears to be preferable since it locates two environmentally degrading activities in one canyon and would impact a smaller amount of wetland and stream habitat.

S20-1

S20-2

Ms. Garrison also stated that the EIS does not investigate the Nuff Canyon site with as much detail as the Apanolio Canyon site. No water quality data was obtained, vegetation and habitat values were not adequately characterized, no attempt was made to estimate the possibility of extending the life of the site through recycling, nor was the ownership status documented. In addition traffic mitigations should be investigated for the Nuff Canyon alternative.

S20-3

It is implied, Ms. Garrison commented, that the project impacts can be mitigated; however, the document does not provide the analysis that this is based upon. No mitigation was offered for the loss of two-thirds of a mile of perennial stream with spawning and rearing habitat. Mitigation measures proposed often compensate for improper management, but should not serve as mitigation (e.g. fish ladders). Finally, it is difficult to believe the resource is only valued at three-tenths of a percent of the cost of the project (value of mitigation plan).

S20-4

Speaker 21: Judith Goldsmith, Resident

Ms. Goldsmith stated that she is greatly concerned that the fish populations of the Bay Area have been diminished because of impingement on their habitat areas. Riparian habitats are disappearing and Ms. Goldsmith noted that she was not aware of any other creek within the Bay Area in as good a shape as Apanolio. She explained that restoration of streams is very expensive and it is very difficult to duplicate an ideal trout stream.

Ms. Goldsmith commented that she found the EIS seriously deficient in regard to consideration of alternative sites and combinations of smaller sites. Also, it lacks adequate discussion of the recycling programs currently underway and planned which could make a significant decrease in the need for landfill space.

S21-1

Apanolio Canyon, Ms. Goldsmith explained, currently has a downstream steelhead and upstream landlocked rainbow trout population and is one of the few creeks in the Bay Area with a wild trout population. This stream has more water than adjoining creeks and Nuff and Corinda Los Trancos do not have such important resident fish populations. The greater quantities of water in this canyon also make it more difficult to build a safe landfill (greater problem controlling leachate).

S21-2

Speaker 22: Anne Schneider, Sierra Club Representative

Ms. Schneider stated that she is on the County's Recycling Task Force and the Chairman of the Recycling Committee at the Sierra Club. She commented that the organizations she represents realize landfills are absolutely necessary, but every effort should be made to extend the life of these facilities. Ms. Schneider noted that the County has done a good job

in moving recycling along and needs to continue to do so. The county should be taking the lead to expand these programs to include waste production programs such as packaging, excessive packaging, excessive use, and reusing materials before they enter the waste stream.

Speaker 23: Steve Kiss, Resident

Mr. Kiss stated that he has visited the disposal site (Ox Mountain) and the San Carlos transfer station and has seen the huge quantities of debris that accumulate in a single day. He stated that he is concerned about the future of our land, rivers, lakes, wildlife, aquatic and plant life and that the impacts related to siting a landfill are serious and such action should not be decided hastily.

Speaker 24: Nan Scott, Resident

Ms. Scott commented on the fact that solid wastes delivered to landfills contain fecal wastes. She stated that this was a very dangerous practice and is concerned about water contamination from landfill operation.

S24-1

Speaker 25: Peg Gunn, Menlo Park Council Member

Ms. Gunn is a former Mayor of Menlo Park and is at present a Council Member. Ms. Gunn stated that she represents 27,000 people of San Mateo County and is concerned of what will happen if no site is permitted for waste disposal in the county. The cost to haul wastes long distances is extremely expensive. She also commented that she is concerned about protection of endangered species; however, since studies show the endangered San Francisco garter snake does not occur at the site this concern should not interfere with development. The health, safety and welfare of human beings is far more important than a species that apparently does not occur at the site.

Speaker 26: Pat Bennie, Resident

Ms. Bennie is a former Mayor and Council Member of the City of San Carlos. She stated that she drives Highway 92 daily and has observed the care, courtesy, cleanliness, and professional manner in which BFI does their job. Ms. Bennie also compared the difference in the methods of waste handling in an urban vs. rural area. The waste disposal problem is very serious and the County has an obligation to dispose of solid wastes within its own boundaries.

Responses to Public Hearing Comments

The comments received at the public hearing that pertain directly to the content of the DEIS have been responded to as well as substantive comments on the project or other solid waste management issues in San Mateo County. In general, the comments received were supportive of the project. These comments are not addressed.

S1-1. Comment noted. The EIS attempts to summarize the rather lengthy process that San Mateo County has been involved in since the early 1960s.

S1-2. Comment noted. The actions required to obtain an agreement for out-of-county disposal is briefly described in Section 3.3 of the EIS. The steps are complicated by jurisdictional constraints, actions by other jurisdictions seeking disposal capacity, environmental review, and fee negotiations.

S11-1. The resource recycling discussion in the EIS has been expanded (see Section 3.5e).

S13-1. The landfill design would meet the stringent requirements of CAC Title 23, Chapter 3, Subchapter 15. In the unlikely event that a failure of the landfill's containment system occurred, contingency remedial action measures would be implemented. An outline of these actions, intended to protect downstream beneficial uses is provided in Appendix D.

S13-2. BFI has not received complaints of increased off-site litter. The Department of Health Services controls and monitors the sanitary conditions at the Ox Mountain facility. To-date, the facility has been given a clean record by this agency. Activities in the canyon would be anticipated to impact secretive wildlife species that would be displaced to areas that are undisturbed by human activities.

S13-3. The County and its cities have been actively pursuing resource recycling efforts. Currently, the County diverts an estimated 22 percent of its solid waste stream from existing landfills. Plans for expansion of these efforts are intended to further reduce the solid waste stream that would be landfilled to a total of 35 percent. San Mateo County has intended the Ox Mountain Ranch, owned by BFI, to be their primary waste disposal site since its identification in the mid-1960s.

S14-1. Comments noted. The Mitigation Plan has been revised based on comments received on the DEIS. This revised Plan is contained in Appendix B.)

S15-1. Since publication of the DEIS, a study of all available fishery information was conducted by Thomas R. Payne & Associates. His study concluded that the fish population in the upper portion of Apanolio Creek should be considered resident rainbow trout (see response to written comment 5-22 and Appendix B).

S15-2. An aquatic invertebrate study has been conducted for segments of Apanolio, Corinda Los Trancos, and Pilarcitos Creeks. See responses to written comments 26-8 and 26-9.

S19-1. Comment noted. Landfill capacity in the State of California and the San Francisco Bay Area is diminishing. With establishment of more stringent regulations enacted for environmental protection, permitting of new landfill sites has become increasingly difficult. The intent of the EIS is to focus on San Mateo County's efforts to permit a solid waste disposal site, and to determine the potential impacts associated with the project alternatives.

S19-2. The EIS discusses, to the extent possible, the impacts of failure to permit a landfill disposal site. The No Action alternative in the EIS evaluates out-of-county disposal, as well as potential use of alternative technology to reduce the volume of the County's solid waste stream. Evaluation of the costs associated with denial of the project, or the social impacts of such an action would be difficult to determine at this time.

S20-1. The EIS attempts to evaluate the extent and value of habitat at each of the alternative sites contained in the EIS. The differences in habitat value, however, are often subjective and difficult to quantify. As presented in the EIS, the habitat value of Apanolio Canyon is greater than habitat found at the alternative sites.

S20-2. Discussion of out-of-county disposal, potential Nuff Canyon landfill configurations, and resource recycling have been expanded in Chapter 3 of the EIS.

S20-3. The Nuff Canyon alternative was investigated at a level of detail appropriate for an EIS alternative. The information presented should be detailed enough to provide decision makers with relative merits and demerits of each of the alternatives. Section 3.5e of the EIS contains expanded information on resource recycling.

S20-4. The Mitigation Plan prepared for the proposed Apanolio Canyon project has been revised to incorporate additional components (see Appendix B). The intent of the Plan is to provide replacement and enhancement of habitat that would be lost from landfill construction by providing equal or greater habitat value. The cost of the mitigation program is not necessarily related to the overall project cost if the plan is deemed adequate.

S21-1. Information regarding alternative sites has been expanded in Section 3.3 of the EIS and recycling efforts in San Mateo County are presented in Section 3.5e. Discussion of combinations of smaller landfill sites/alternatives is presented in response to comment 22-9.

S21-2. The protection of downstream beneficial uses of Apanolio Creek would be provided through the streamflow augmentation plan (Appendix D), and the contingency remedial action plan (Appendix D). Corinda Los Trancos and Nuff Canyons do not appear to support the quality of fishery found in Apanolio Canyon; however, proposed mitigation to enhance habitat within Corinda Los Trancos Creek and mitigations proposed for other streams (see Mitigation Plan, Appendix B) are intended to provide compensation for loss of the fishery in the project area.

The landfill designed proposed for Apanolio Canyon would provide adequate control of surface and ground-water flows within the project area. Leachate control is integrated into the landfill design components, and in the event that landfill containment of leachate failed, contingency remedial actions would be implemented. Similar geologic and hydrologic conditions occur at each of the proposed alternatives. A more complex leachate and ground-water collection system would be required for the Corinda Los Trancos and Nuff Canyon alternatives and could slightly increase the risk of leachate release.

S24-1. See response to written comments 13-1 and 13-2.

INDEX

Aesthetics

1-13, 1-24, 1-25, 4-95, 5-75, 5-94

Agency contact and coordination

6-3

Aquatic

4-53 - 4-57, 5-26 - 5-29, 5-31 - 5-35, 6-5

BAAQMD

2-14, 2-17, 3-12, 4-76 - 4-78, 4-85, 4-87, 5-51, 5-56, 5-60, 6-5

Bay Area Air Quality Management District

2-14, 4-76, 4-85, 6-5

Beneficial uses

1-16, 2-13, 3-32, 3-57, 3-58, 4-22, 4-23, 4-35, 4-44, 5-12, 5-13, 5-16, 5-19, 5-20, 5-94, 5-95, 6-5

Biology

1-9, 1-16, 4-44, 5-13, 5-19, 5-22, 5-62, 5-92, 5-93

CCC

2-15, 2-17

CDFG

2-14, 2-17, 4-53 - 4-56, 5-28, 5-36, 5-40, 6-4, 6-5

CWMB

2-15, 2-17

California Coastal Commission

2-15, 4-102, 6-3

Climate

4-75

Closure

1-3, 1-11, 1-19, 1-22, 2-4, 2-10, 3-56, 3-70, 5-58, 5-59, 5-69, 5-85 - 5-87, 5-89, 5-95

Comparison of alternatives

1-13

Construction costs

5-85

Consultation and coordination

6-1

Contingency plan

1-8, 1-12, 3-57, 3-58, 5-4, 5-11, 5-18, 5-20, 5-21, 5-29, 5-62, 5-83, 5-86 - 5-88, 5-94

Corps

1-1, 1-2, 1-6, 1-9, 1-16, 1-17, 2-1, 2-8, 2-11 - 2-13, 3-1, 3-25, 3-26, 3-69, 4-1, 4-47, 4-48, 4-50, 4-61, 5-24, 5-27, 5-32, 5-35, 5-80 - 5-83, 5-93, 6-1 - 6-7

Corps alternative definitions

3-25

Costs

1-13, 1-27, 3-2, 3-12, 3-16, 3-21, 3-22, 3-55, 3-58, 3-59, 3-65, 3-69, 3-75, 4-106, 4-114, 4-115, 5-39, 5-83, 5-85 - 5-88, 5-91

County landfill history

2-2, 2-3

Cultural resources

1-13, 1-24, 2-12, 4-89, 4-92 - 4-94, 4-101, 5-73, 5-74, 5-94

Cumulative

5-58, 5-91, 5-92

Dust generation

4-77, 4-85, 4-86, 5-52, 5-56, 5-60, 5-64, 5-66, 5-67

EIS

1-2, 1-5, 1-26, 2-1, 2-2, 2-8, 2-12, 2-13, 3-1, 3-24, 3-32, 3-69, 4-48,
4-50, 5-24, 5-28, 5-80 - 5-83, 6-1, 6-2, 6-6

EPA

2-12, 2-14, 2-17, 4-41, 6-4

Economics

1-13, 1-26, 4-108, 5-83

Employment and income

4-111

Energy dissipators

3-39, 3-45, 3-64, 3-68, 5-20

Environmental impact statement

1-1, 2-1, 2-8, 2-11, 6-1

Erosion

1-7, 1-9, 1-14, 1-15, 3-33, 3-52, 3-65, 4-12, 4-16, 4-17, 4-36, 4-43,
4-57, 5-2, 5-5, 5-6, 5-10 - 5-14, 5-17, 5-19, 5-21, 5-22, 5-29, 5-38,
5-61, 5-91

Erosion and sedimentation

1-7, 5-2, 5-5, 5-6, 5-10, 5-11

Erosion control

1-9, 3-52, 3-65, 5-13, 5-17, 5-19, 5-22

Existing air quality

4-76

Existing traffic levels

4-66

Faults and fractures

4-10, 4-13, 4-17

Federal agencies

2-8, 2-11, 4-84, 6-4, 6-7

Filling sequence

3-35, 3-59

Final site array

3-23

Fires

1-12, 1-22, 1-23, 4-87, 4-89, 5-61, 5-64, 5-66, 5-68, 5-71

Fisheries

1-10, 1-17, 1-18, 2-12, 5-35, 5-37, 6-2

Fishery

1-10, 1-18, 3-8, 3-23, 4-53, 4-54, 5-28, 5-34, 5-36, 5-37, 6-4, 6-5

Fugitive dust

1-11, 1-20, 4-77, 4-84, 4-85, 5-52, 5-60, 5-63, 5-67, 5-92

General Plan
1-26, 4-100, 4-101, 4-104, 4-105, 4-107, 5-79, 5-81

Geology
1-7, 1-14, 3-9, 3-10, 3-32, 4-1, 4-4, 4-12, 4-13, 4-107, 5-1, 5-10,
5-68, 5-93

Ground-water collection
3-8, 3-38, 3-45, 3-47, 3-57, 3-64, 3-66, 5-13

History of proposed action
2-7

Housing
4-109 - 4-111

Hydrology
1-7, 1-8, 1-15, 4-20, 4-23, 4-35, 4-41, 5-4, 5-11, 5-15 - 5-18, 5-20,
5-62, 5-91, 5-94

Hydrology and water quality
1-8, 1-15, 4-20, 5-4, 5-11, 5-17, 5-20, 5-62, 5-91, 5-94

Invertebrates
4-55, 4-61

Land use plans and policies
4-99, 5-78, 5-79, 5-82

Landfill design
3-31, 3-35, 3-59, 3-64, 3-66, 5-66, 5-68

Landfill design rationale
3-31, 3-64

Landfill emissions
4-76

Landfill gases
1-20, 4-77, 4-84, 4-85, 5-51, 5-60, 5-63, 5-65, 5-67

Landfill liner
1-4, 1-8, 1-9, 3-8, 3-33, 3-39, 3-47, 5-2, 5-4 - 5-6, 5-8, 5-10, 5-11,
5-62, 5-64, 5-94

Landfill site selection criteria
3-2

Level of service
4-66 - 4-68, 5-41, 5-43, 5-45

Local coastal program
2-15, 2-16, 4-100, 4-102

Marbled murrelet
4-58, 4-59

NEPA
1-2, 6-1

NOI
2-1, 6-2

Noise sources
4-79, 5-59

Notice of Intent
2-1, 6-2

Peak flow reduction ponds
1-9, 3-34, 3-39, 3-41

Perimeter ditch drainage system

3-39, 3-44

Planned roadway improvements

4-69

Plans and policies

1-13, 1-25, 2-18, 4-99, 4-100, 4-104, 4-105, 4-107, 5-78, 5-79, 5-82

Population

3-3, 3-9, 3-10, 3-12, 3-13, 3-32, 4-99, 4-103, 4-108, 4-109, 4-111, 5-34,
5-41, 5-60, 5-92, 5-93

Potential landfill sites

2-7, 3-3, 3-6, 3-11, 3-25

Project costs

3-55, 5-83, 5-85, 5-86, 5-88

Project history

1-1

Proposed action

1-1, 1-3 - 1-7, 1-9 - 1-11, 2-2, 2-7, 2-11, 2-12, 2-14, 2-15, 3-1, 3-24,
3-26, 3-55, 3-69, 5-95, 6-1, 6-2

Proposed action alternatives

1-4

Public facilities and services

1-12, 1-23, 4-88, 5-71, 5-72

Public health and safety

1-12, 1-22, 4-84, 5-60, 5-69, 5-73, 5-94

Public involvement

6-1

Public notice

6-1, 6-2, 6-5

Purpose and need

1-2, 2-2, 2-9

Quarry truck traffic

1-19, 4-75

RWQCB

2-4, 2-13, 2-17, 3-12, 3-32, 3-56, 3-58, 3-70, 4-22, 4-23, 4-25, 4-35,
4-39, 4-41, 5-21, 6-4, 6-6

References

4-48

Regulatory framework

2-2, 2-11, 2-17, 4-84, 4-100

Riparian

1-16 - 1-18, 3-7, 3-9, 3-10, 3-23, 4-45 - 4-50, 4-53, 4-96, 5-24, 5-27,
5-30, 5-32, 5-34, 5-36 - 5-39, 5-92, 5-95

Scoping

6-1 - 6-3, 6-6

Sediment basin

3-45, 3-49, 3-52, 3-64, 3-68, 5-37, 5-38

Seismicity

1-7, 1-14, 4-1, 4-11, 4-16, 4-17, 5-1, 5-10

Sensitive receptors

4-78, 4-82, 4-83, 5-55, 5-56, 5-59

Sensitive species

4-53, 4-58, 4-59, 5-35

Site access

1-3, 1-5, 1-6, 3-52, 3-68, 4-70, 4-94

Site drainage

1-4, 3-38, 3-39, 3-56

Site identification studies

3-3, 3-6, 3-12

Site maintenance

3-55

Site security

4-88, 5-63, 5-65, 5-67, 5-69

Slope stability

5-1, 5-4 - 5-6, 5-8

Solid waste collection, hauling, and disposal costs

4-114

Solid waste management plan

1-3, 1-5, 1-13, 1-26, 2-2 - 2-6, 2-9, 2-15, 3-3, 3-11, 3-12, 3-14, 3-22,
3-74, 4-84, 4-100, 4-102, 4-104, 6-6

State agencies

2-12, 2-13, 2-17, 6-7

Storm drainage system

3-38, 3-39

Summary of impacts from proposed action

1-7

Summary of site evaluation

3-20

Suspended solids

5-14

TDS

4-39, 4-41

Topography

1-7, 1-14, 1-15, 1-25, 3-41, 3-44, 3-54, 4-3, 4-6, 4-12, 4-16, 4-37, 4-44,
5-1, 5-4, 5-5, 5-8, 5-11, 5-57, 5-93

Total Dissolved Solids

4-39, 4-41, 5-91

Traffic delay

5-46

Traffic delays

4-73, 5-54, 5-62

Traffic noise

1-12, 1-21, 4-80 - 4-83, 5-56, 5-59

Traffic restrictions

1-10, 4-72, 4-75, 5-50

Transportation

1-10, 1-18, 1-19, 3-16, 3-21, 4-64, 4-68, 4-69, 4-88, 4-101, 4-106, 4-110,
4-112, 5-40, 5-50, 5-53, 5-54, 5-56, 5-59, 5-71, 5-91

Truck traffic

1-10, 1-11, 1-19, 1-21, 3-10, 3-20, 3-21, 3-23, 3-31, 3-54, 4-73 - 4-75,
4-79, 4-81, 4-83, 4-87, 4-88, 5-41, 5-43, 5-45, 5-47 - 5-50, 5-59, 5-62,
5-63, 5-65, 5-67 - 5-69, 5-92

Turbidity

1-9, 1-16, 5-14, 5-33, 5-35, 5-91

USFWS

2-12, 2-17, 4-59, 4-61 - 4-63, 6-4, 6-6, 6-7

Unavoidable adverse impacts

5-93

Underdrain pipe system

3-39

United States Fish and Wildlife Service

2-12

Vectors

1-12, 4-84, 4-86, 5-60, 5-64, 5-66, 5-68, 5-70

Vehicle emissions

1-20, 4-76, 5-53, 5-54

Waste acceptance

3-14, 3-55

Waste disposal site survey

3-3, 3-14, 3-20

Water quality

1-7 - 1-9, 1-12, 1-15, 1-16, 2-4, 2-11 - 2-14, 2-17, 3-2, 3-14, 3-21,
3-32, 3-57, 4-20, 4-22, 4-23, 4-35, 4-37, 4-39, 4-41, 4-43, 4-44, 5-4,
5-5, 5-11, 5-13, 5-15 - 5-20, 5-27 - 5-29, 5-33, 5-35, 5-62, 5-64, 5-66,
5-91, 5-94, 5-95, 6-3, 6-4, 6-7

Water supply

1-12, 4-20, 4-22, 4-35, 4-37, 4-44, 5-13, 5-16, 5-17, 5-19, 5-62, 5-64,
5-66, 5-68

Water uses

4-22

Wetland

2-1, 2-8, 2-17, 3-2, 3-7, 3-8, 3-10, 3-14, 3-23, 4-47, 4-48, 4-50, 5-30,
5-34, 5-36 - 5-39, 5-80, 5-92, 5-93, 5-95, 6-5

Wetlands

1-4, 1-9, 1-16 - 1-18, 2-11, 2-13, 3-2, 3-20, 3-26, 4-47, 4-48, 4-50,
5-24, 5-30, 5-32, 5-34, 5-35, 5-78, 5-82, 5-83, 6-5